



# CARIBE WAVE 2016

## ICG CARIBE EWS Tsunami Exercise



**Elizabeth Vanacore**  
Task Team Leader CARIBE WAVE 2016  
Puerto Rico Seismic Network, UPRM

**Christa G. von Hillebrandt-Andrade**  
ICG CARIBE EWS Chair  
Manager

**Carolina Hincapié-Cárdenas**  
Deputy Manager

**Cherryamar Reyes**  
Student Intern

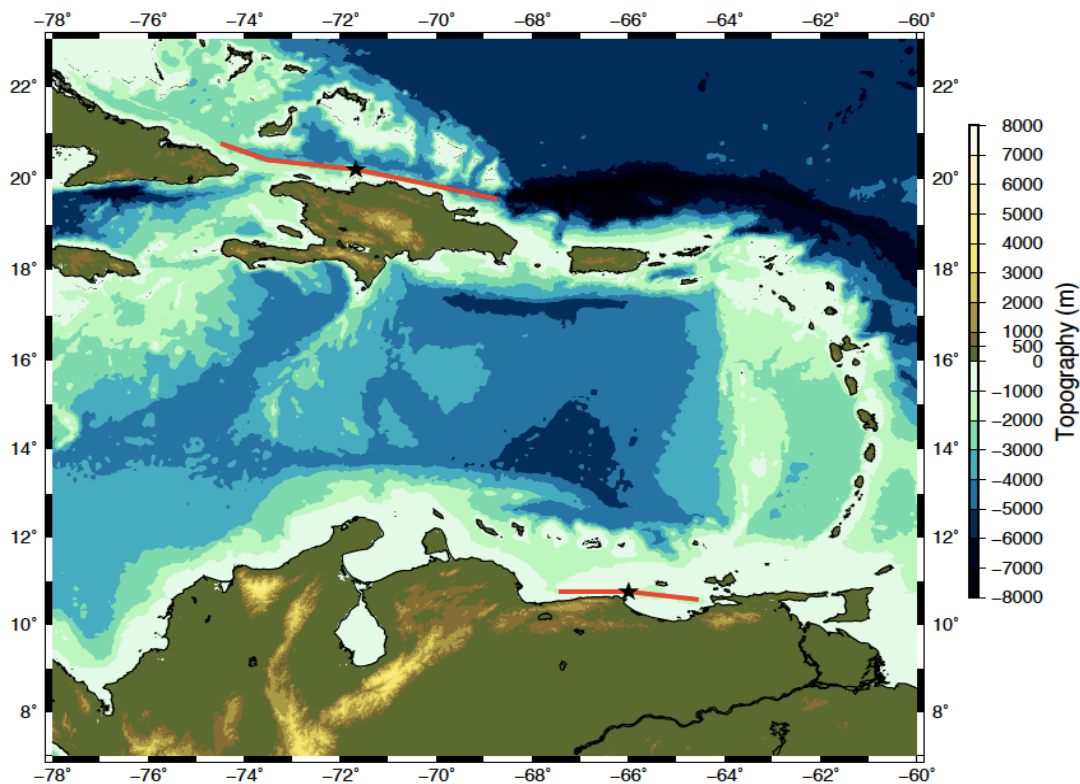
NOAA NWS Caribbean Tsunami Warning Program

**AGENDA 3.9**

**April 5-7, 2016**

# CARIBE WAVE 16

## Scenarios



Scenario	Origin Time	Mw	Epicenter
Venezuela	14:00:00 UTC March 17, 2016	8.4	10.8°N, 66.0°W
Northern Hispaniola	15:00:00 UTC March 17, 2016	8.7	20.2°N, 71.7°W

# Timeline

<b>ACTION</b>	<b>DUE DATE</b>
<b>Draft Circulated among ICG CARIBE EWS TNC/TWFP</b>	September- 2015
<b>Deadline for Comments</b>	September 18, 2015
<b>Final Exercise Handbook Available Online</b>	October 15, 2015
<b>Circular Letter Issued by IOC to MS</b>	November, 2015
<b>1<sup>st</sup> Webinar CW</b>	January 19, 20, 21 – 2016
<b>2<sup>nd</sup> Webinar CW</b>	March 1, 2, 3 - 2016
<b>Exercise Registration Deadline</b>	March 11, 2016
<b>Exercise</b>	March 17, 2016
<b>Exercise Evaluation Due</b>	March 23, 2016
<b>Draft Final Caribe 16 Report</b>	April 1, 2016
<b>Discussion of Exercise ICG CARIBE EWS 11<sup>th</sup> Session</b>	April 5-7, 2016

Metric	Result 2013	Result 2014	Result 2015	Metric 2016	Result 2016
Participation of Member States of ICG CARIBE EWS	94%	98%	100%	100%	100%
Compliance with the time line	Close to 100%	Almost 100%	100%	100%	100%
Community involvement (beyond TWFP/NTWC)	69%	75%	%	85%	67%
Number people registered	50,000	191,000	191,420	210,000	271,000
TWFP/NTWC receive the dummy message	98%	94%	90%	100%	N/A
TNC/TWFP of Countries submit exercise questionnaire	90%	100%	100%	100%	98%
Social Media Hashtag usage (Facebook and Twitter)	N/A	N/A	N/A	N/A	~3,000 (rough estimate PRSN)



# Participation

Table 5: List of participants by Country/Territory in 2015 and 2016

Member State/Territory	Number of Participants Final Report 2015	Number of Participants registered on TsunamiZone.org	Number of Participants with post exercise updates from ME
Anguilla	1150	1,160	1,160
Antigua and Barbuda	63	393	393
Aruba	25	3	3
Bahamas	7	5	5
Barbados	1000	154	154
Belize	9	27	27
Bermuda	6	158	158
Brazil	1	10	10
British Virgin Islands	4200	4,613	4,682
Cayman Islands	18	20	20
Colombia	77	23	23
Costa Rica	30	30	30
Cuba	2	133	133
Curacao	35	80	80
Dominica	100	353	353
Dominican Republic	43	126	126
France	99	147	147
Grenada	9	14,239	14,300
Guadeloupe	3000	62,928	62,928
Guatemala	12	10	10

Guyana	12	10	10
Haiti	44	190	190
Honduras	1	6	6
Jamaica	2	-	10
Martinique	8637	21,731	21,731
Netherlands (Bonaire, Saba, St. Eustatius)	-	5	5
Mexico	500	610	610
Montserrat	1	-	12
Nicaragua	100	25	25
Panama	600	958	958
Puerto Rico	80,953	118,875	118,875
Saint Kitts and Nevis	109	2,720	2,720
Saint Lucia	6	560	565
Saint Martin	550	26	26
Saint Vincent and the Grenadines	30	35	35
Sint Maarten	25	400	400
Suriname	1	-	5
Trinidad and Tobago	30,104	279	279
Turks and Caicos Islands	25	30	30
U.S. Virgin Islands	4793	2,928	2,928
Venezuela	31,685	37,021	37,021
<b>Total</b>	<b>191,420</b>	<b>271,021</b>	<b>271,183</b>

# Types of Participants

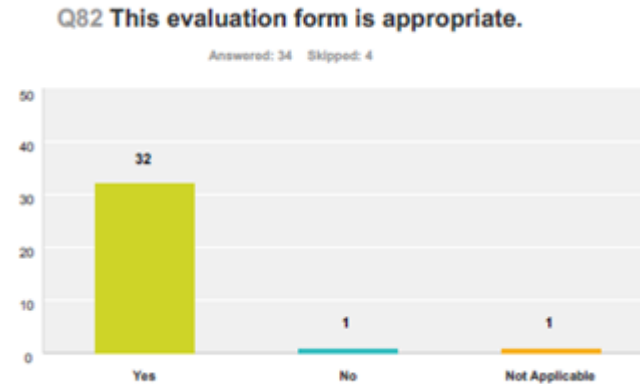
Category	Number of Participants
Individuals/Families	1,484
Childcare and Pre-Schools	2,696
K-12 Schools and Districts	125,185
Colleges and Universities	36,256
Government*	78,072
Businesses	1,485
Hotels and Other Lodgings	3,079
Healthcare	4,841
Senior Facilities/Communities	294
Disability/AFN Organizations	30
Non-Profit Organizations	1,587
Neighborhood Groups	82
Preparedness Organizations	12,094
Faith-based Organizations	276
Museums, Libraries, Parks, etc.	20
Volunteer/Service Clubs	981
Youth Organizations	35
Volunteer Radio Groups	103
Science/Engineering Organizations	417
Media Organizations	47
Other	1,930
Total	270,994

“Involvement of the private sector was very successful. Other hotels want to participate next year.” (Sint Maarten)

# Evaluation Form

<https://www.surveymonkey.com/r/CaribeWave16>

- Contained 83 questions, few updates from 2015, added PAE and Tsunami Ready questions
- To be completed by individuals by March 23rd (last survey was received April 1st). Around 50% met the deadline, fwup was required for remaining
- Responses from 100% of each MS who participated in the exercise
- Mine of information, not only on exercise, but also general preparedness of the country
- Further analysis work required



Comments: Some say it is a little long, request it to be in Spanish, allow users to return and complete.

Analysis Comment: Turn around time for analysis for the ICG XI meeting was very tight

# **Survey was completed by 38 TNCs/TWFPs which represented 32 MS and 15 Territories\***

Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Brazil\*, Colombia, Costa Rica, Curacao, Dominica, Dominican Republic, France (Martinique, Guadeloupe, St. Barthelemy, St. Martin), Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Netherlands (Bonaire, Saba and Sint Eustatius) Nicaragua, Panama, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Sint Maarten, Suriname, Trinidad and Tobago, United Kingdom (Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Montserrat, Turks and Caicos), United States (Puerto Rico and the US Virgin Islands) and Venezuela (Bolivarian Republic of)

\*Participated as an Observer, as no TWFP was designated at the time of the exercise

# Objective 1

- ✓ **To exercise and evaluate operations of the CARIBE EWS Tsunami Warning System.**
  - Validate the **issuance** of tsunami products from the PTWC.
  - Validate the **receipt** of tsunami products by CARIBE EWS Tsunami Warning Focal Points (TWFPs) and/or National Tsunami Warning Centers (NTWCs).

# Dummy Message with Transmission Methods for Venezuela (14h05 UTC) and Northern Hispaniola (15h05 UTC)

Center	WMO ID	AWIPS ID	NWWS	GTS	EMWIN	AISR	Fax	Email
PTWC	WECA41 PHEB	TSUCAX	Yes	Yes	Yes	Yes	Yes	Yes

NWWS

NOAA Weather Wire Service

GTS

Global Telecommunications System

EMWIN

Emergency Manager's Weather Information Network

AISR

Aeronautical Information System Replacement

***Two Dummy Messages were issued, but they only went out vis AWIPS, NWWS, GTS and AISR. The FAX and EMAIL dissemination from PTWC thru ISC failed.***

**Start of Exercise messages were also sent out by  
PTWC and CTWP twitter accounts. Can be received  
by text: “Follow NWS\_CTWP” or “Follow  
NWS\_PTWC” to 40404**

NWS\_PTWC

NWS\_CTWP

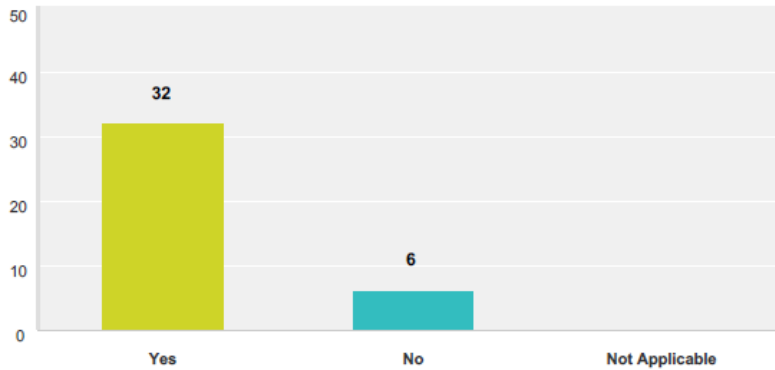
“This is a test message for the CARIBEWAVE16  
Venezuela tsunami exercise.” (issued at 14h05 UTC).

“This is a test message for the CARIBEWAVE16  
Northern Hispaniola tsunami exercise.” (issued at  
15h05 UTC).



**Q9 1B.1: The PTWC CARIBE WAVE 16 initial Dummy (Start of Exercise) Message was received by your country's Tsunami Warning Focal Point.**

Answered: 38 Skipped: 0

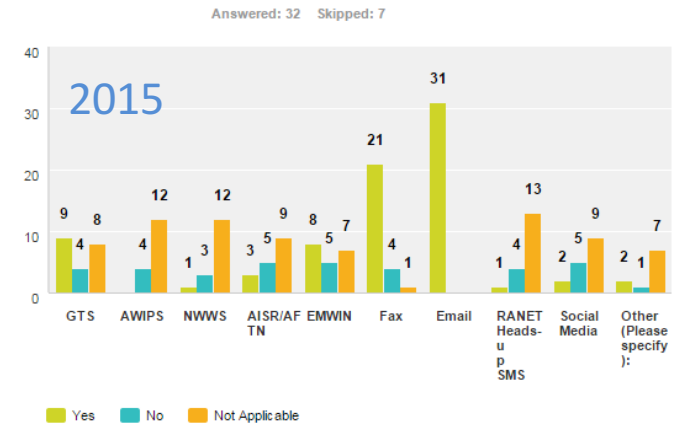
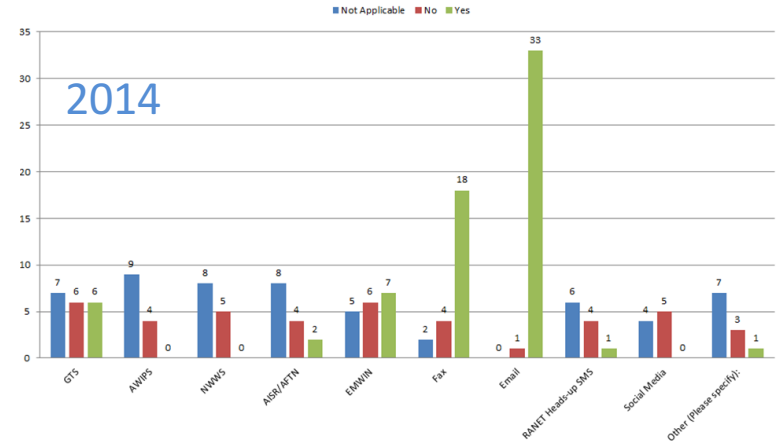
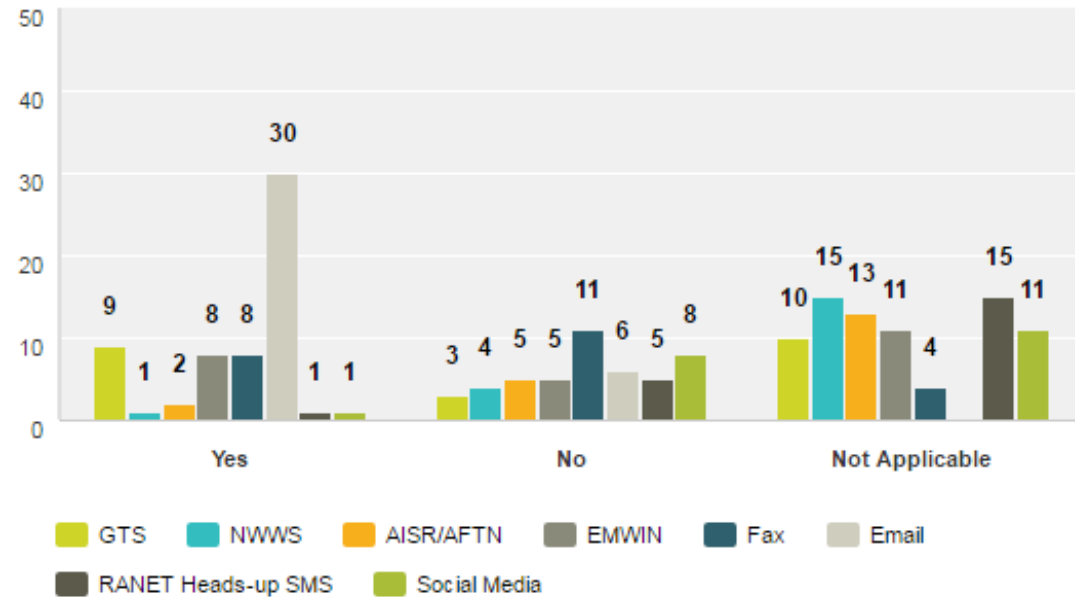


Answer Choices	Responses	Count
Yes	84.21%	32
No	15.79%	6
Not Applicable	0.00%	0
Total		38

**“This was a first communication test for the islands Bonaire, St Eustace and Saba, although the last island could not yet participate in this exercise. We plan to extend the test next year, but this test was already very useful.”  
(Netherlands)**

**Considering it was not sent by FAX or EMAIL, more should have said NO. There seemed to be a confusion between the reception of the Dummy Message and the Simulated Messages, that DID go out via Email**

# Receipt of Messages



2016 saw 9 GTS users, less than expected (19). Fax and Email were not sent. Only 1 social media (Twitter)

# Objective 2

- ✓ **To continue the process of exposure to PTWC CARIBE EWS Enhanced products.**
- Evaluate enhanced PTWC products.
- Provide further feedback on the national procedures for implementation of the enhanced products.

## Appendix F. TWC Exercise Messages

### Venezuela Earthquake Scenario

The following messages created for the CARIBE WAVE 16 tsunami exercise are representative of the official standard products issued by the PTWC during a large magnitude 8.4 earthquake and tsunami originating in Venezuela. During a real event, NWS and TWFP would be sent via email the graphical products. The alerts would persist longer during a real event than is depicted in this exercise.

#### PTWC Message #1

WECA41 PHEB 171405

TSUCAX

EXPERIMENTAL TSUNAMI MESSAGE NUMBER 1

NOT FOR DISTRIBUTION

NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI

1405 UTC THU MAR 17 2016

...TSUNAMI THREAT MESSAGE...

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED INFORMATION.

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

PRELIMINARY EARTHQUAKE PARAMETERS

-----  
\* MAGNITUDE 8.5  
\* ORIGIN TIME 1400 UTC MAR 17 2016  
\* COORDINATES 10.8 NORTH 66.0 WEST  
\* DEPTH 15 KM / 9 MILES  
\* LOCATION NEAR THE COAST OF VENEZUELA

## EVALUATION

- 
- \* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.4 OCCURRED NEAR THE COAST OF VENEZUELA AT 1400 UTC ON THURSDAY MARCH 17 2016.
  - \* BASED ON THE PRELIMINARY EARTHQUAKE PARAMETERS... WIDESPREAD HAZARDOUS TSUNAMI WAVES ARE POSSIBLE.

## TSUNAMI THREAT FORECAST

- 
- \* HAZARDOUS TSUNAMI WAVES FROM THIS EARTHQUAKE ARE POSSIBLE WITHIN THE NEXT THREE HOURS ALONG SOME COASTS OF

VENEZUELA... BONAIRE... CURACAO... ARUBA... SAINT VINCENT... GRENADA... PUERTO RICO... SAINT LUCIA... US VIRGIN ISLANDS... MARTINIQUE... DOMINICA... GUADELOUPE... DOMINICAN REP... SABA... MONTserrat... SAINT KITTS... SINT EUSTATIUS... BARBADOS... HAITI... TRINIDAD TOBAGO... SINT MAARTEN... COLOMBIA... ANGUILLA... ANTIGUA... BR VIRGIN ISLANDS... BARBUDA... SAINT BARTHELEMY... TURKS N CAICOS... CUBA... SAINT MARTIN... JAMAICA... BAHAMAS... PANAMA AND CAYMAN ISLANDS

## RECOMMENDED ACTIONS

- 
- \* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.
  - \* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL

\* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES LISTED WITH A POTENTIAL TSUNAMI THREAT. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES	ETA(UTC)
CUMANA	VENEZUELA	10.5N 64.2W	1438 03/17
MAIQUETIA	VENEZUELA	10.6N 67.0W	1448 03/17
ONIMA	BONAIRE	12.3N 68.3W	1455 03/17
WILLEMSTAD	CURACAO	12.1N 68.9W	1501 03/17
ORANJESTAD	ARUBA	12.5N 70.0W	1519 03/17
KINGSTOWN	SAINT VINCENT	13.1N 61.2W	1519 03/17
SAINT GEORGES	GRENADA	12.0N 61.8W	1519 03/17
CASTRIES	SAINT LUCIA	14.0N 61.0W	1524 03/17
FORT DE FRANCE	MARTINIQUE	14.6N 61.1W	1527 03/17
ROSEAU	DOMINICA	15.3N 61.4W	1529 03/17
BASSE TERRE	GUADELOUPE	16.0N 61.7W	1532 03/17
SANTO DOMINGO	DOMINICAN REP	18.5N 69.9W	1538 03/17
SABA	SABA	17.6N 63.2W	1541 03/17
CABO ENGANO	DOMINICAN REP	18.6N 68.3W	1543 03/17
PLYMOUTH	MONTERRAT	16.7N 62.2W	1544 03/17
BASSETERRE	SAINT KITTS	17.3N 62.7W	1545 03/17
SINT EUSTATIUS	SINT EUSTATIUS	17.5N 63.0W	1546 03/17
BRIDGETOWN	BARBADOS	13.1N 59.6W	1548 03/17
JACAMEL	HAITI	18.1N 72.5W	1552 03/17
PIRATES BAY	TRINIDAD TOBAGO	11.3N 60.6W	1553 03/17
SIMPSON BAAI	SINT MAARTEN	18.0N 63.1W	1554 03/17
RIOHACHA	COLOMBIA	11.6N 72.9W	1605 03/17
BARRANQUILLA	COLOMBIA	11.1N 74.9W	1611 03/17
PUERTO PLATA	DOMINICAN REP	19.8N 70.7W	1613 03/17
THE VALLEY	ANGUILLA	18.3N 63.1W	1614 03/17
SAINT JOHNS	ANTIGUA	17.1N 61.9W	1618 03/17
PALMETTO POINT	BARBUDA	17.6N 61.9W	1624 03/17
SAINT BARTHELEM	SAINT BARTHELEMY	17.9N 62.8W	1625 03/17
GRAND TURK	TURKS N CAICOS	21.5N 71.1W	1627 03/17
CARTAGENA	COLOMBIA	10.4N 75.6W	1628 03/17
CAP HAITEN	HAITI	19.8N 72.2W	1629 03/17
SANTIAGO D CUBA	CUBA	19.9N 75.8W	1631 03/17
BAIE BLANCHE	SAINT MARTIN	18.1N 63.0W	1632 03/17
KINGSTON	JAMAICA	17.9N 76.9W	1635 03/17
WEST CAICOS	TURKS N CAICOS	21.7N 72.5W	1638 03/17
MAYAGUANA	BAHAMAS	22.3N 73.0W	1639 03/17
GREAT INAGUA	BAHAMAS	20.9N 73.7W	1642 03/17
ALIGANDI	PANAMA	9.2N 78.0W	1645 03/17
BARACOA	CUBA	20.4N 74.5W	1647 03/17
MONTEGO BAY	JAMAICA	18.5N 77.9W	1647 03/17
CROOKED ISLAND	BAHAMAS	22.7N 74.1W	1647 03/17
PORT OF SPAIN	TRINIDAD TOBAGO	10.6N 61.5W	1649 03/17
SANTA MARTA	COLOMBIA	11.2N 74.2W	1652 03/17
PUERTO CARRETO	PANAMA	8.8N 77.6W	1652 03/17
SAN SALVADOR	BAHAMAS	24.1N 74.5W	1652 03/17
LONG ISLAND	BAHAMAS	23.3N 75.1W	1656 03/17
CAYMAN BRAC	CAYMAN ISLANDS	19.7N 79.9W	1702 03/17
PUNTA CARIBANA	COLOMBIA	8.6N 76.9W	1704 03/17s

POTENTIAL IMPACTS

\* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

\* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.

\* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

\* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEEPED OUT TO SEA.

NEXT UPDATE AND ADDITIONAL INFORMATION

\* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

\* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

\* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

\* COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS... AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR THOSE PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

\* COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S. NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND AT NTWC.ARH.NOAA.GOV.

**PTWC Message #2**

WECA41 PHEB 171425  
TSUCAX

EXPERIMENTAL TSUNAMI MESSAGE NUMBER 2

NOT FOR DISTRIBUTION

NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
1425 UTC THU MAR 17 2016

...TSUNAMI THREAT MESSAGE...

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE  
UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR  
THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL  
AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF  
ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED  
INFORMATION.

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

UPDATES

-----

\* THE ESTIMATED MAGNITUDE OF THE EARTHQUAKE IS REDUCED FROM  
8.5 TO 8.4.

\* FORECAST TSUNAMI AMPLITUDES ARE NOW INCLUDED.

PRELIMINARY EARTHQUAKE PARAMETERS

-----

\* MAGNITUDE 8.4  
\* ORIGIN TIME 1400 UTC MAR 17 2016  
\* COORDINATES 10.8 NORTH 66.0 WEST  
\* DEPTH 15 KM / 9 MILES  
\* LOCATION NEAR THE COAST OF VENEZUELA

EVALUATION

-----

\* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.4 OCCURRED  
NEAR THE COAST OF VENEZUELA AT 1400 UTC ON THURSDAY MARCH 17  
2016.

\* BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE  
FORECAST FOR SOME COASTS.

TSUNAMI THREAT FORECAST...UPDATED

-----

\* TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE  
LEVEL ARE POSSIBLE ALONG SOME COASTS OF  
GUADELOUPE... AND VENEZUELA.

\* TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE  
POSSIBLE ALONG SOME COASTS OF

ARUBA... COLOMBIA... DOMINICAN REPUBLIC... HAITI... PUERTO  
RICO AND VIRGIN IS... ANGUILLA... ANTIGUA AND BARBUDA...  
DOMINICA... GRENADA... JAMAICA... MARTINIQUE...  
MONTSERRAT... CURACAO... BONAIRE... SAINT KITTS AND  
NEVIS... SAINT LUCIA... SINT MAARTEN... SAINT  
BARTHELEMY... SAINT MARTIN... SAINT VINCENT AND THE  
GRENADINES... AND TRINIDAD AND TOBAGO.

\* TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL  
ARE POSSIBLE FOR SOME COASTS OF

COSTA RICA... CUBA... GUYANA... MEXICO... NICARAGUA...  
PANAMA... BARBADOS... AND TURKS AND CAICOS ISLANDS.

\* NON-HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR ALL OTHER  
AREAS COVERED BY THIS MESSAGE.

\* ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST  
AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL  
FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS  
WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

\* FOR OTHER AREAS COVERED BY THIS PRODUCT A FORECAST HAS NOT  
YET BEEN COMPUTED. THE FORECAST WILL BE EXPANDED AS  
NECESSARY IN SUBSEQUENT PRODUCTS.

RECOMMENDED ACTIONS

\* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.

\* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL

\* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THREATENED REGIONS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES	ETA(UTC)
CUMANA	VENEZUELA	10.5N 64.2W	1438 03/17
MAIQUETIA	VENEZUELA	10.6N 67.0W	1448 03/17
ONIMA	BONAIRE	12.3N 68.3W	1455 03/17
WILLEMSTAD	CURACAO	12.1N 68.9W	1501 03/17
ORANJESTAD	ARUBA	12.5N 70.0W	1519 03/17
KINGSTOWN	SAINT VINCENT	13.1N 61.2W	1519 03/17
SAINT GEORGES	GRENADA	12.0N 61.8W	1519 03/17
CASTRIES	SAINT LUCIA	14.0N 61.0W	1524 03/17
FORT DE FRANCE	MARTINIQUE	14.6N 61.1W	1527 03/17
ROSEAU	DOMINICA	15.3N 61.4W	1529 03/17
BASSE TERRE	GUADELOUPE	16.0N 61.7W	1532 03/17
SANTO DOMINGO	DOMINICAN REP	18.5N 69.9W	1538 03/17
CABO ENGANO	DOMINICAN REP	18.6N 68.3W	1543 03/17
PLYMOUTH	MONTserrat	16.7N 62.2W	1544 03/17
BASSETERRE	SAINT KITTS	17.3N 62.7W	1545 03/17
BRIDGETOWN	BARBADOS	13.1N 59.6W	1548 03/17
JACAMEL	HAITI	18.1N 72.5W	1552 03/17
PIRATES BAY	TRINIDAD TOBAGO	11.3N 60.6W	1553 03/17

SIMPSON BAAI	SINT MAARTEN	18.0N 63.1W	1554 03/17
RIOHACHA	COLOMBIA	11.6N 72.9W	1605 03/17
BARRANQUILLA	COLOMBIA	11.1N 74.9W	1611 03/17
PUERTO PLATA	DOMINICAN REP	19.8N 70.7W	1613 03/17
THE VALLEY	ANGUILLA	18.3N 63.1W	1614 03/17
SAINT JOHNS	ANTIGUA	17.1N 61.9W	1618 03/17
PALMETTO POINT	BARBUDA	17.6N 61.9W	1624 03/17
SAINT BARTHELEM	SAINT BARTHELEMY	17.9N 62.8W	1625 03/17
GRAND TURK	TURKS N CAICOS	21.5N 71.1W	1627 03/17
CARTAGENA	COLOMBIA	10.4N 75.6W	1628 03/17
CAP HAITEN	HAITI	19.8N 72.2W	1629 03/17
SANTIAGO D CUBA	CUBA	19.9N 75.8W	1631 03/17
BAIE BLANCHE	SAINT MARTIN	18.1N 63.0W	1632 03/17
KINGSTON	JAMAICA	17.9N 76.9W	1635 03/17
WEST CAICOS	TURKS N CAICOS	21.7N 72.5W	1638 03/17
ALIGANDI	PANAMA	9.2N 78.0W	1645 03/17
MONTEGO BAY	JAMAICA	18.5N 77.9W	1647 03/17
PORT OF SPAIN	TRINIDAD TOBAGO	10.6N 61.5W	1649 03/17
SANTA MARTA	COLOMBIA	11.2N 74.2W	1652 03/17
PUERTO CARRETO	PANAMA	8.8N 77.6W	1652 03/17
PUNTA CARIBANA	COLOMBIA	8.6N 76.9W	1704 03/17
JEREMIE	HAITI	18.6N 74.1W	1713 03/17
PUNTO FIJO	VENEZUELA	11.7N 70.2W	1715 03/17
PUERTO OBALDIA	PANAMA	8.7N 77.4W	1716 03/17
CIENFUEGOS	CUBA	22.0N 80.5W	1725 03/17
PUERTO LIMON	COSTA RICA	10.0N 83.0W	1729 03/17
COLON	PANAMA	9.4N 79.9W	1749 03/17
BOCAS DEL TORO	PANAMA	9.4N 82.2W	1803 03/17
COZUMEL	MEXICO	20.5N 87.0W	1811 03/17
PUNTA GORDA	NICARAGUA	11.4N 83.8W	1815 03/17
PORT AU PRINCE	HAITI	18.5N 72.4W	1816 03/17
GOLFO VENEZUELA	VENEZUELA	11.4N 71.2W	1855 03/17
SANTA CRZ D SUR	CUBA	20.7N 78.0W	1930 03/17
PORLAMAR	VENEZUELA	10.9N 63.8W	1931 03/17
GEORGETOWN	GUYANA	6.8N 58.2W	2014 03/17
NUEVA GERONA	CUBA	21.9N 82.8W	2055 03/17
PUERTO CABEZAS	NICARAGUA	14.0N 83.4W	2154 03/17

## POTENTIAL IMPACTS

---

- \* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.
- \* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.
- \* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.
- \* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEEPED OUT TO SEA.

## NEXT UPDATE AND ADDITIONAL INFORMATION

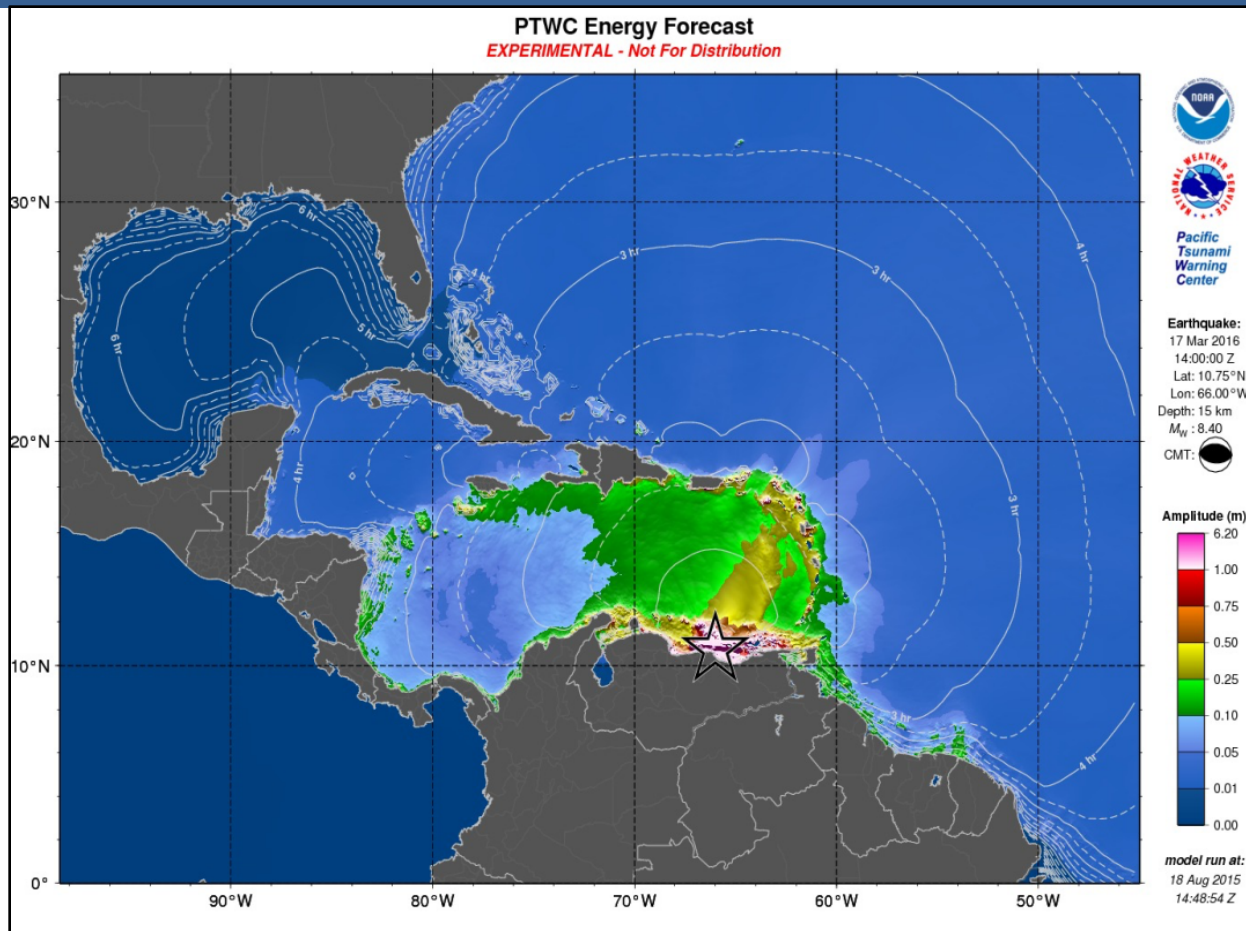
---

- \* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.
- \* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT [EARTHQUAKE.USGS.GOV/EARTHQUAKES](http://EARTHQUAKE.USGS.GOV/EARTHQUAKES) -ALL IN LOWERCASE LETTERS-.
- \* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT [PTWC.WEATHER.GOV](http://PTWC.WEATHER.GOV) AND AT [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).
- \* COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS... AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR THOSE PLACES THAT CAN BE FOUND AT [PTWC.WEATHER.GOV](http://PTWC.WEATHER.GOV).
- \* COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S. NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND AT [NTWC.ARH.NOAA.GOV](http://NTWC.ARH.NOAA.GOV).



# Energy Forecast for Tsunami Wave Heights

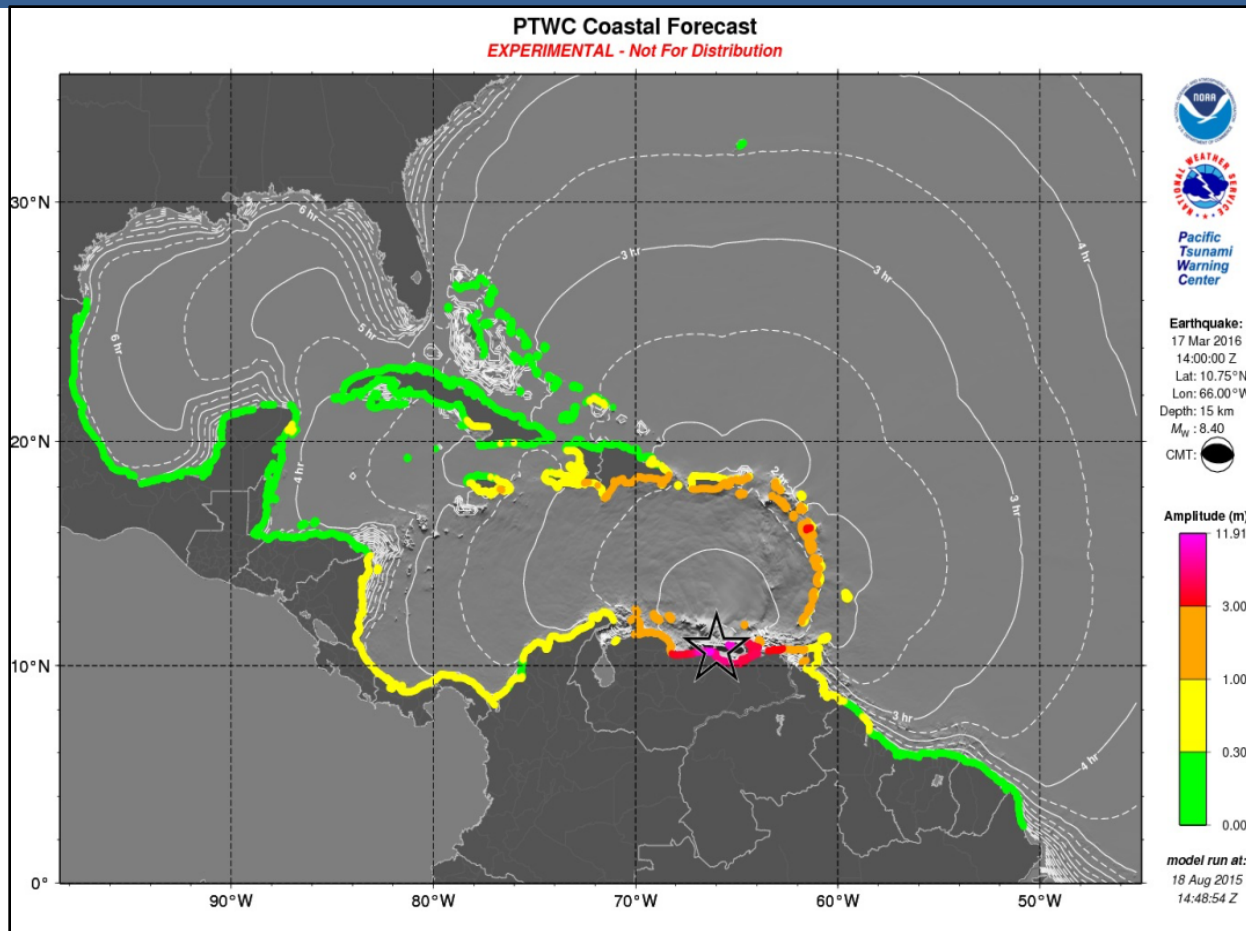
## Venezuela



**RIFT maximum tsunami amplitude in the deep ocean for the CARIBE EWS area of service based on the Venezuela scenario.**

During a real event and for this exercise this product will only be sent by Email to officially designated Tsunami Warning Focal Points and National Tsunami Warning Centers.

# Coastal Forecast for Tsunami Wave Heights Venezuela

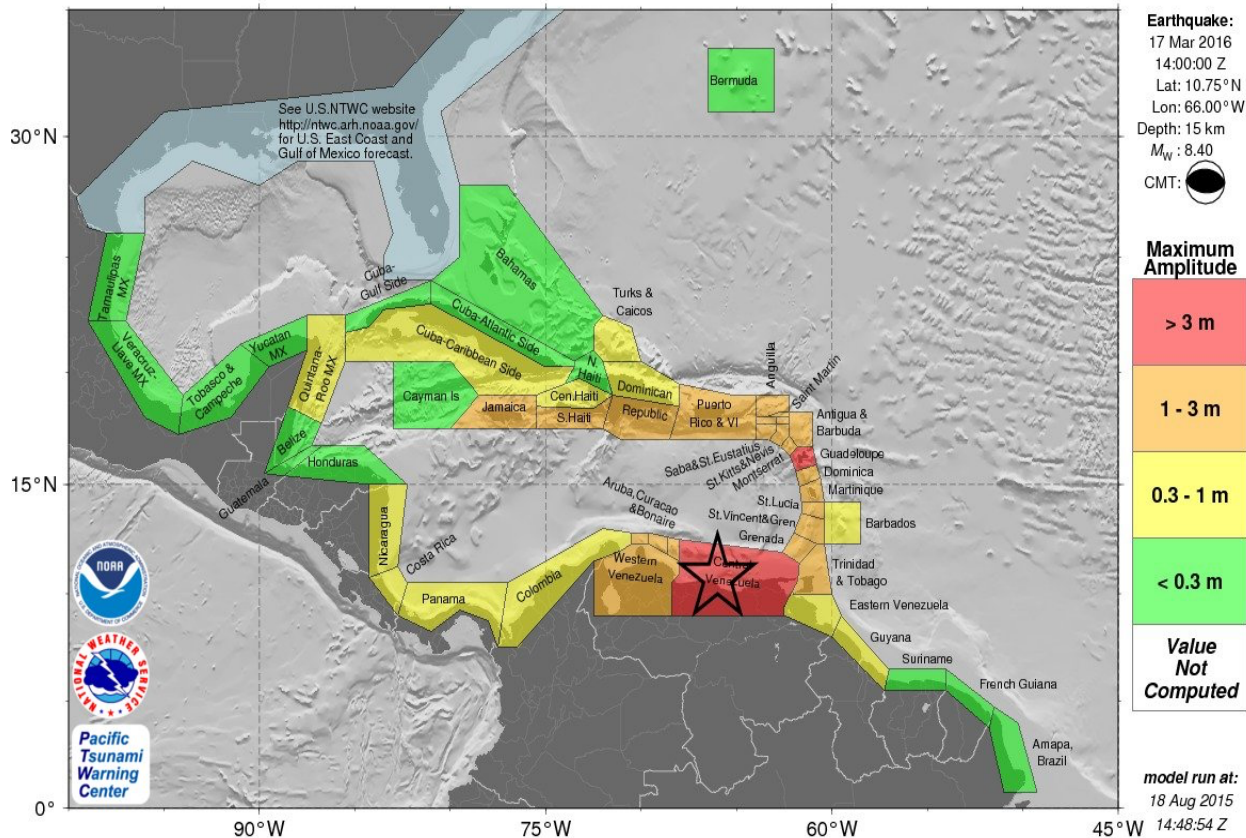


**RIFT forecast tsunami heights for individual forecast points for the CARIBE EWS area of service based on the Venezuela scenario.**

During a real event and for this exercise this product will only be sent by Email to officially designated Tsunami Warning Focal Points and National Tsunami Warning Centers.

# Polygons Forecast for Tsunami Wave Heights Venezuela

PTWC Forecast Polygons **EXPERIMENTAL - Not For Distribution**



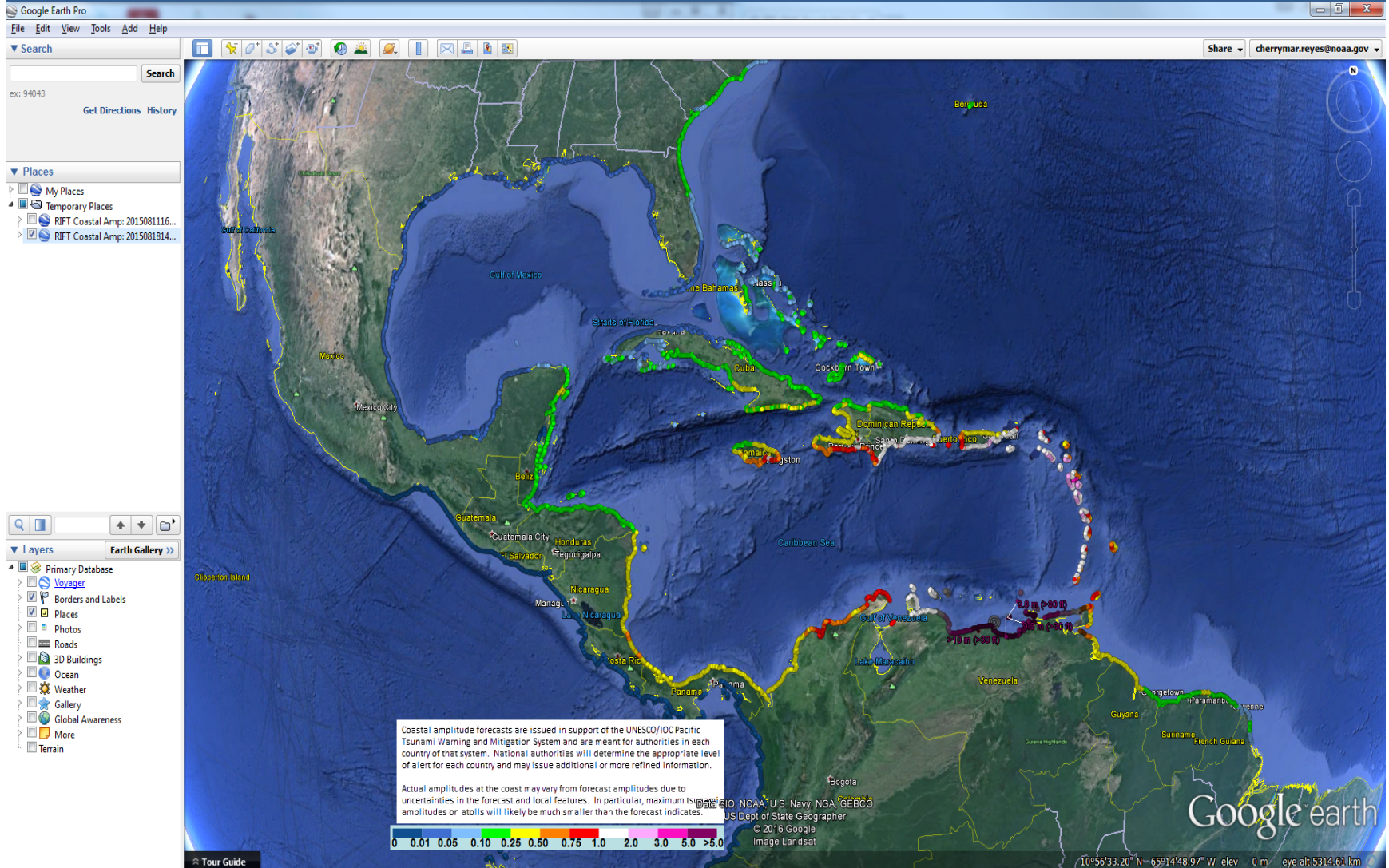
**RIFT forecast polygons for the CARIBE EWS area of service for the Venezuela scenario.**

During a real event and for this exercise this product will only be sent by Email to officially designated Tsunami Warning Focal Points and National Tsunami Warning Centers.



# KMZ

## Venezuela



[C:\Users\ctwp.sad\Desktop\CARIBE WAVE 16\coastal\\_amp\\_Vz.kmz](C:\Users\ctwp.sad\Desktop\CARIBE WAVE 16\coastal_amp_Vz.kmz)

# PTWC Polygon Table

PTWC RIFT Tsunami Forecast Model - Run ID: 20150818144854

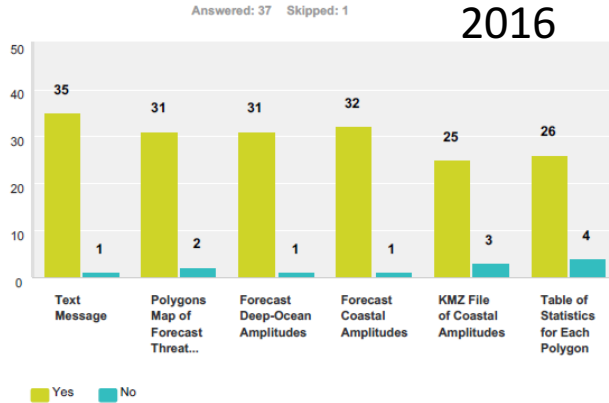
Earthquake - Origin: 03/17/2016 14:00:00 UTC Coordinates: 10.8N 66.0W Depth: 015km Magnitude: 8.4

Coastal Forecast (meters)				Offshore Forecast (meters)				Total Points	Region Name
Maximum	Mean	Median	STD	Maximum	Mean	Median	STD		
12.00	5.40	5.10	2.30	6.20	2.30	2.00	1.30	244	Central_Coast_of_Venezuela
3.10	2.00	2.00	0.73	1.50	0.67	0.65	0.29	71	Guadeloupe
2.80	1.80	1.60	0.53	6.10	1.50	1.20	0.98	100	Western_Coast_of_Venezuela
2.60	1.80	1.80	0.44	0.85	0.47	0.46	0.13	31	Dominica
2.50	1.20	0.74	0.75	2.10	0.93	0.66	0.58	28	Antigua_and_Barbuda
2.50	2.00	1.90	0.27	1.50	0.60	0.54	0.24	29	Saint_Kitts_and_Nevis
2.40	1.00	1.10	0.53	1.90	0.56	0.48	0.38	189	Puerto_Rico_and_Virgin_Is
2.30	1.60	1.50	0.40	1.70	0.85	0.83	0.41	15	Bonaire
2.30	1.50	1.80	0.56	1.90	0.60	0.49	0.32	41	Martinique
2.20	1.50	1.50	0.24	0.64	0.40	0.36	0.11	8	Saba_and_Saint_Eustatius
2.20	1.80	1.80	0.20	0.79	0.50	0.45	0.12	11	Montserrat
1.90	1.30	1.40	0.43	1.10	0.40	0.36	0.19	26	Saint_Lucia
1.90	1.40	1.40	0.23	0.70	0.46	0.45	0.13	27	Curacao
1.50	1.20	1.20	0.19	1.40	0.51	0.46	0.23	148	Caribbean_Coast_of_Dominican_Republic
1.50	1.20	1.30	0.20	0.79	0.68	0.70	0.08	6	Saint_Barthelémy
1.50	1.40	1.50	0.06	1.30	0.79	0.73	0.32	6	Sint_Maarten
1.40	1.00	1.10	0.28	1.10	0.45	0.35	0.23	29	Grenada
1.40	1.20	1.20	0.21	0.99	0.40	0.33	0.18	33	Saint_Vincent_and_the_Grenadines
1.40	1.10	1.20	0.31	1.60	1.10	1.10	0.27	8	Anguilla
1.30	1.20	1.20	0.05	0.68	0.46	0.42	0.11	8	Aruba
1.30	1.30	1.30	0.00	1.30	1.20	1.10	0.08	3	Saint_Martin
1.20	0.72	0.66	0.27	0.83	0.39	0.37	0.18	77	Trinidad_and_Tobago
1.10	0.47	0.45	0.24	0.67	0.19	0.13	0.14	146	Jamaica
1.10	0.76	0.78	0.16	0.71	0.25	0.22	0.12	89	Caribbean_Coast_of_Haiti
1.00	0.54	0.51	0.22	0.94	0.36	0.31	0.17	255	Caribbean_Coast_of_Colombia
0.89	0.60	0.62	0.15	0.31	0.19	0.19	0.06	22	Barbados
0.71	0.26	0.23	0.11	1.50	0.14	0.09	0.19	129	Atlantic_Coast_of_Dominican_Republic
0.55	0.48	0.48	0.04	0.28	0.18	0.18	0.04	48	Caribbean_Coast_of_Costa_Rica
0.50	0.45	0.46	0.03	0.45	0.19	0.18	0.06	82	Atlantic_Coast_of_Venezuela
0.49	0.41	0.40	0.04	0.41	0.19	0.17	0.06	179	Caribbean_Coast_of_Panama
0.47	0.40	0.41	0.03	0.29	0.15	0.15	0.06	139	Caribbean_Coast_of_Nicaragua
0.45	0.36	0.37	0.05	0.26	0.10	0.09	0.04	139	Gulf_of_Gonave_Coast_of_Haiti
0.37	0.27	0.28	0.03	0.26	0.15	0.14	0.04	101	Guyana
0.36	0.21	0.15	0.10	0.14	0.07	0.07	0.03	46	Turks_and_Caicos_Islands
0.35	0.15	0.14	0.09	0.14	0.05	0.05	0.03	166	Quintana_Roo_Mexico
0.31	0.16	0.14	0.08	0.14	0.05	0.04	0.02	472	Caribbean_Coast_of_Cuba
0.30	0.22	0.21	0.04	0.14	0.06	0.06	0.02	66	Atlantic_Coast_of_Haiti
0.27	0.15	0.16	0.03	0.32	0.10	0.08	0.06	84	French_Guiana
0.27	0.24	0.24	0.01	0.34	0.15	0.14	0.06	109	Suriname
0.25	0.12	0.16	0.07	0.09	0.03	0.04	0.02	267	Atlantic_Coast_of_Cuba
0.23	0.11	0.09	0.04	0.24	0.04	0.03	0.02	442	Bahamas
0.20	0.16	0.17	0.02	0.12	0.07	0.07	0.02	90	Belize
0.19	0.13	0.12	0.02	0.19	0.06	0.05	0.02	185	Caribbean_Coast_of_Honduras
0.19	0.18	0.18	0.00	0.07	0.06	0.06	0.01	13	Caribbean_Coast_of_Guatemala
0.16	0.15	0.16	0.00	0.14	0.08	0.06	0.04	7	Bermuda
0.14	0.05	0.02	0.04	0.13	0.02	0.01	0.02	1071	Mainland-Gulf
0.11	0.03	0.03	0.01	0.02	0.01	0.01	0.00	119	Gulf_of_Mexico_Coast_of_Cuba
0.10	0.10	0.10	0.00	0.14	0.05	0.05	0.03	64	Amapa_Brazil
0.09	0.09	0.09	0.01	0.05	0.04	0.03	0.01	5	Cayman_Islands
0.06	0.02	0.01	0.02	0.02	0.00	0.00	0.01	59	Yucatan_Mexico
0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	126	Tamaulipas_Mexico
0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	152	Veracruz_Mexico
0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	181	Tabasco_and_Campeche_Mexico

# Feedback on Enhanced Products

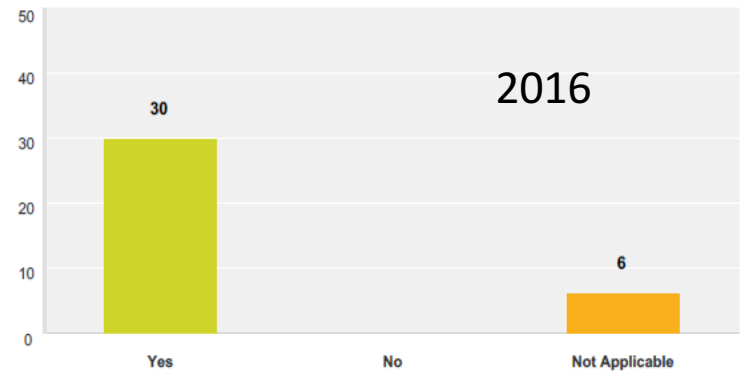
Q15 2A.1: Was the information provided in the following PTWC products understood by the TWFP/NTWC?

Answered: 37 Skipped: 1



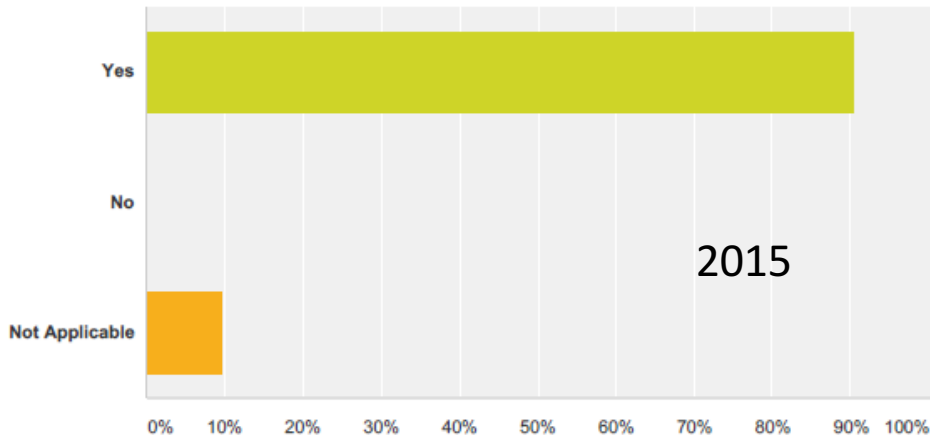
PTWC exercise products assisted with decision making, e.g., tsunami threats, earthquake parameters, estimated arrival times, forecast wave heights, etc.

Answered: 36 Skipped: 2



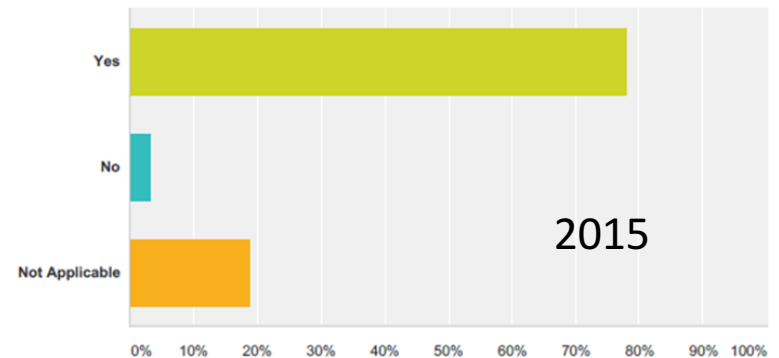
Q20 2A.1: The information contained in the enhanced products is understandable.

Answered: 31 Skipped: 8



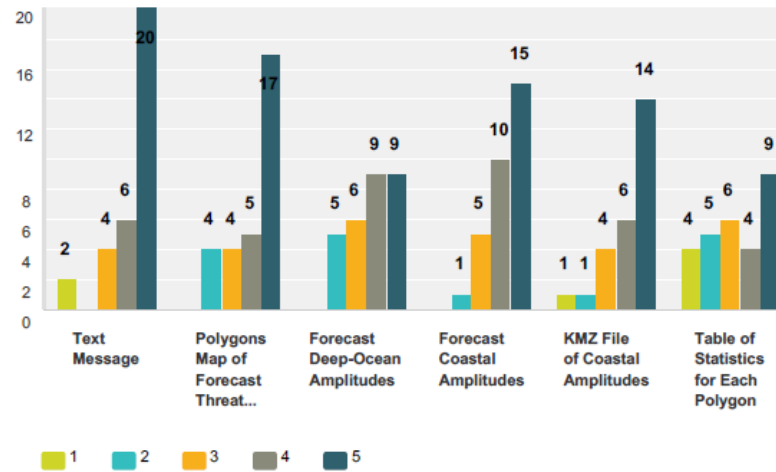
Q21 2A.2: The information contained in the enhanced products helps with your decision-making.

Answered: 32 Skipped: 7



**Q17 2A.3:Rate each product on its usefulness in decision making from 1 (less) to 5 (most).**

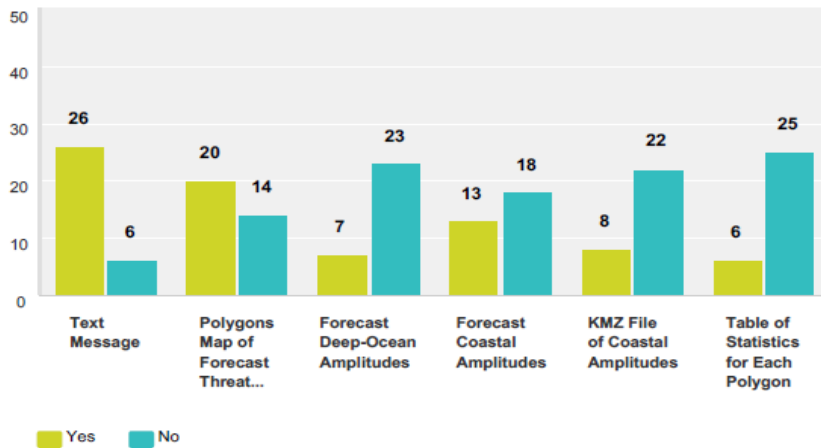
Answered: 33 Skipped: 5



	1	2	3	4	5	Total	Weighted Average
Text Message	6.25% 2	0.00% 0	12.50% 4	18.75% 6	62.50% 20	32	4.31
Polygons Map of Forecast Threat Levels	0.00% 0	13.33% 4	13.33% 4	16.67% 5	56.67% 17	30	4.17
Forecast Deep-Ocean Amplitudes	0.00% 0	17.24% 5	20.69% 6	31.03% 9	31.03% 9	29	3.76
Forecast Coastal Amplitudes	0.00% 0	3.23% 1	16.13% 5	32.26% 10	48.39% 15	31	4.26
KMZ File of Coastal Amplitudes	3.85% 1	3.85% 1	15.38% 4	23.08% 6	53.85% 14	26	4.19
Table of Statistics for Each Polygon	14.29% 4	17.86% 5	21.43% 6	14.29% 4	32.14% 9	28	3.32

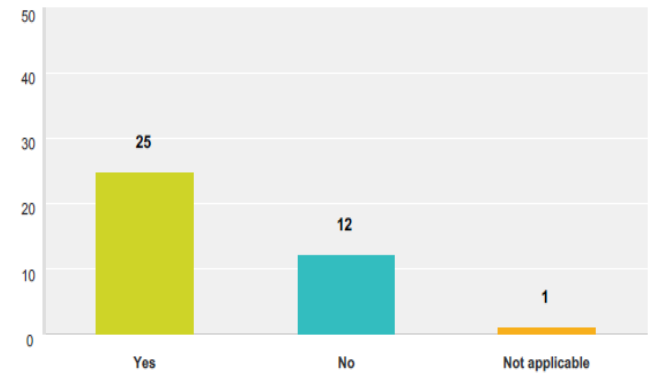
**Q21 2B.1: Currently only the text messages are available to the public. Indicate which of the others PTWC enhanced products that are currently sent via email to only TWFP/NTWC should be made available to the general public (for example: through PTWC, web, media and etc.).**

Answered: 36 Skipped: 2



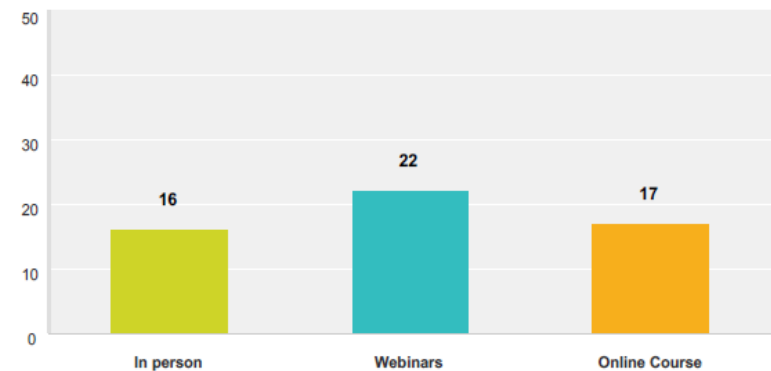
**Q22 2B.2: Do you require additional training on PTWC enhanced products.**

Answered: 38 Skipped: 0



**Q23 2B.3: What type of training?**

Answered: 27 Skipped: 11





# Objective 3

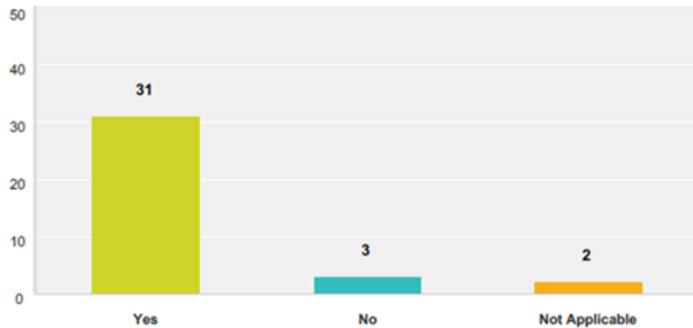
- ✓ **To validate the readiness to respond to a tsunami.**
  - Validate the operational readiness of the TWFP (or like function) and/or the National Disaster Management Office (NDMO).
  - To improve operational readiness. Before the exercise, ensure appropriate tools and response plan(s) have been developed, including public education materials.
  - Validate that the dissemination of warnings and information/advice by TWFP's and NTWC's, to relevant in-country agencies and the public is accurate and timely.
  - Validate the organizational decision-making process (tsunami response plans) about public warnings and evacuations.
  - Validate that the methods used to notify and instruct the public are accurate and timely.
  - Evaluate the status of the National Public Awareness and Education Strategy.
  -

# TWFP Readiness

2016

Q24 3A.1: The TWFP/NDMO has an activation and response process (standard operating procedures) in place for the receipt of tsunami warnings.

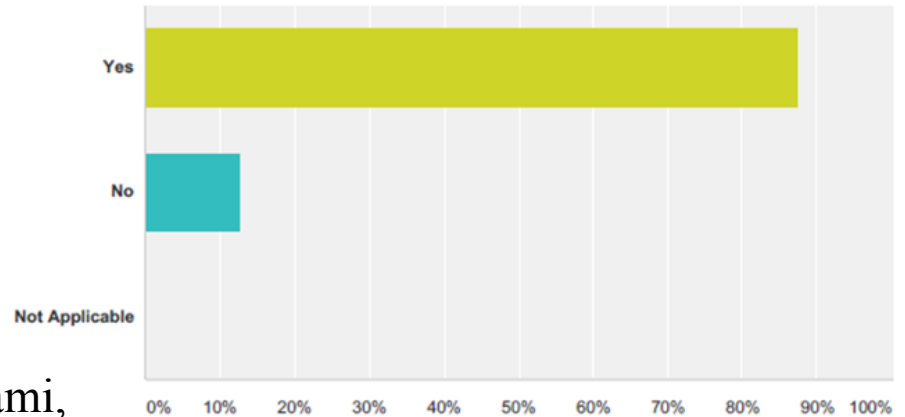
Answered: 36 Skipped: 2



2015

Q29 3A.1: The TWFP/NDMO has an activation and response process (standard operating procedures) in place for the receipt of tsunami warnings.

Answered: 32 Skipped: 7



“Currently there is no plan specific to Tsunami, but out of the Table-Top exercise held yesterday during the Caribe Wave Exercise, it was agreed that one is needed and that it will be done before the next Caribe Wave Exercise.”  
(Guyana)

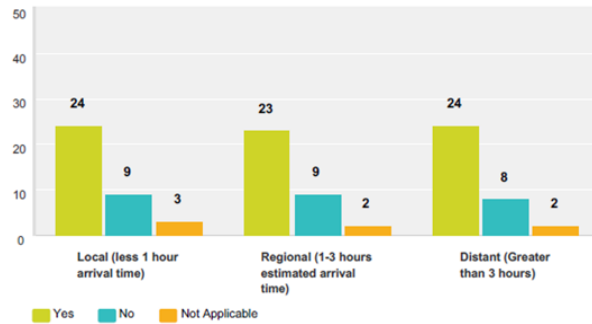
(81% in 2014)

# Tsunami Response Planning

2016

Q30 3B.2: A country tsunami emergency response plan (standard operating procedures) for tele/regional/local tsunamis exists.

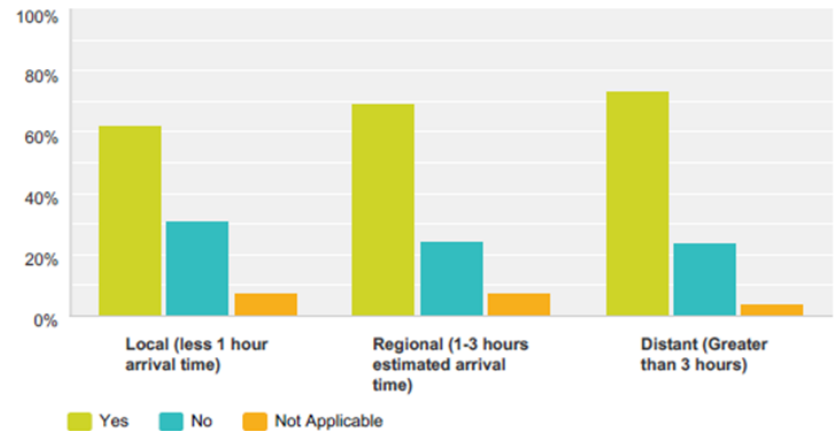
Answered: 36 Skipped: 2



2015

Q35 3B.2: A country tsunami emergency response plan (standard operating procedures) for tele/regional/local tsunamis exists.

Answered: 31 Skipped: 8



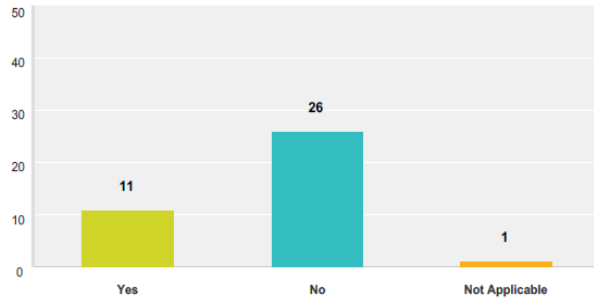
(2014: 63% local, 67% regional, and 70% distant in 2014)

# Tsunami Response Planning

2016

Q28 3A.5: The TWFP/NDMO has a tsunami mass coastal evacuation plan.

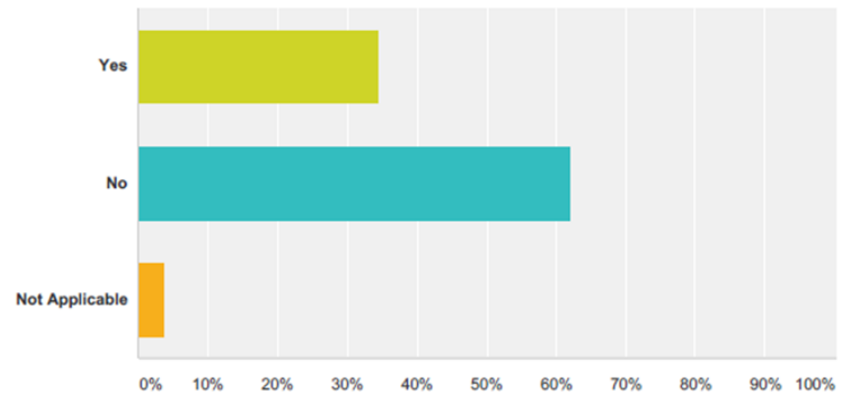
Answered: 38 Skipped: 0



2015

Q33 3A.5: The TWFP/NDMO has a tsunami mass coastal evacuation plan.

Answered: 29 Skipped: 10

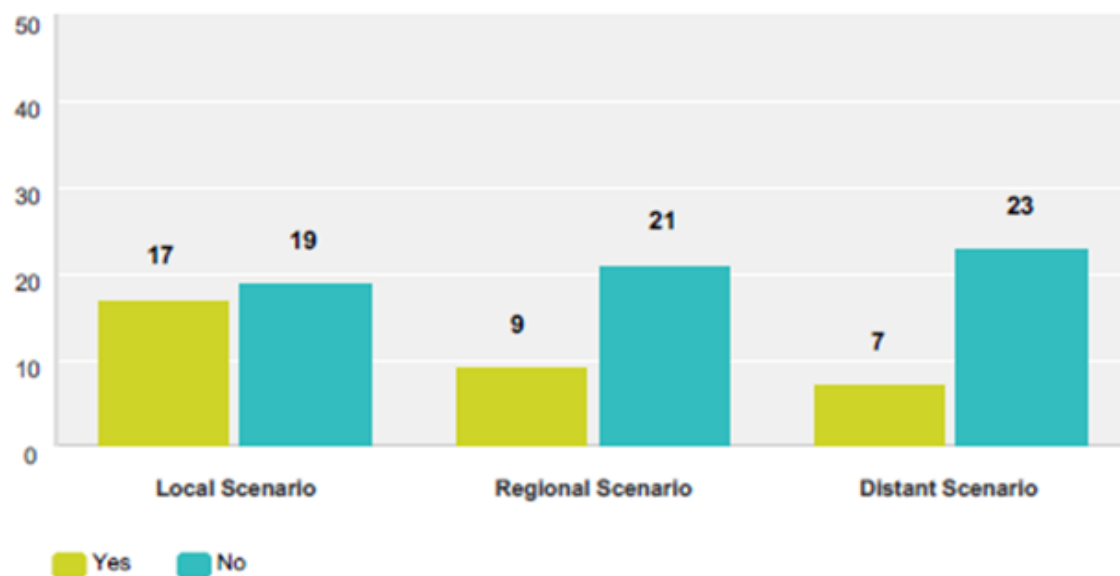


(2014: 22%)

Answer Choices	Responses	Count
Yes	28.95%	11
No	68.42%	26
Not Applicable	2.63%	1
<b>Total</b>		<b>38</b>

## Q48 3D.4: Are tsunami inundation maps available for your Country/Territory?

Answered: 36 Skipped: 2



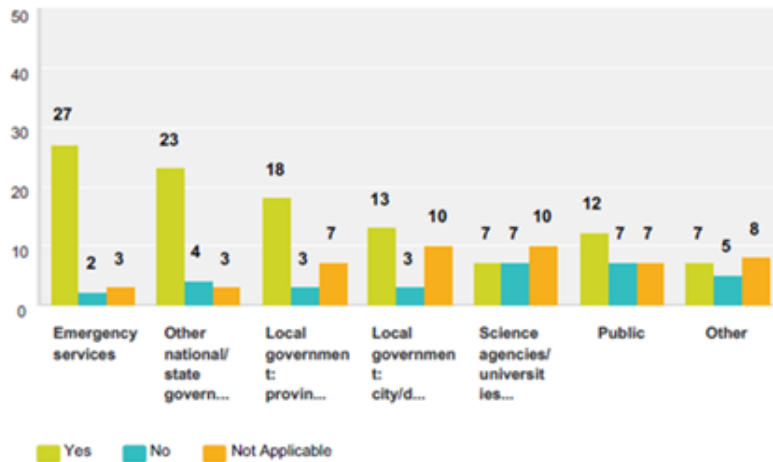
	Yes	No	Total
Local Scenario	47.22% 17	52.78% 19	36
Regional Scenario	30.00% 9	70.00% 21	30
Distant Scenario	23.33% 7	76.67% 23	30

# Alert Dissemination

2016

Q37 3C.2: The alert was disseminated to:

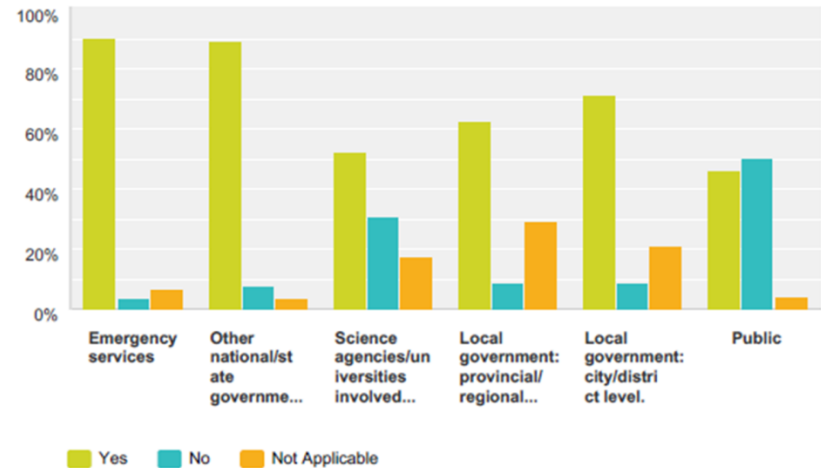
Answered: 34 Skipped: 4



2015

Q42 3C.2: The alert was disseminated to:

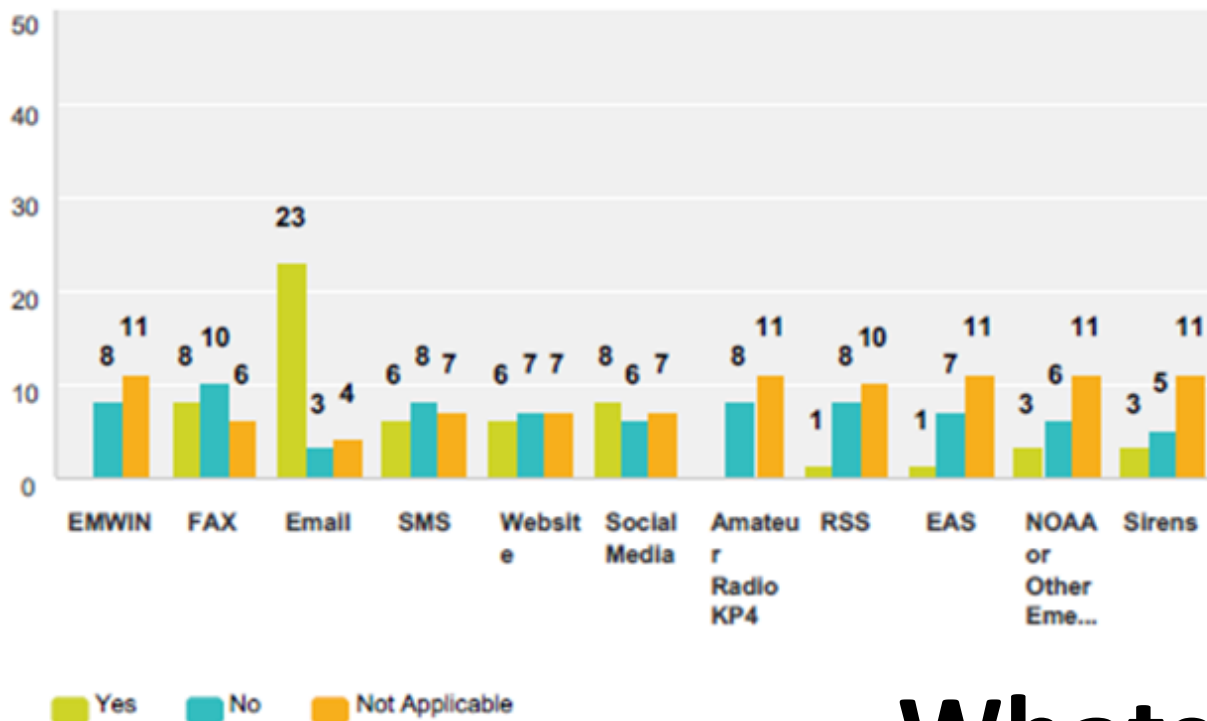
Answered: 31 Skipped: 8



# Alert Dissemination

Q40 3C.5: What methods were used by the TWFP to disseminate the warning/information products to the NDMO or like agency?

Answered: 32 Skipped: 6



Whatsapp

# Registration System

Hosted by University of Southern California, TsunamiZone.ORG  
funded by US NTHMP

The screenshot shows the registration page for TsunamiZone. At the top, there is a navigation bar with links for Home, TsunamiZone Regions, Other Languages, Contact Us, Search, and Login. Below this is a banner image featuring a city skyline and a person running, with the text 'The TsunamiZone' and 'Cal/Alaska Tsunami Preparedness Week Mar 27-Apr 22, 2016'. A secondary navigation bar contains links: Register Here!, Know Your Zone, Who is Participating?, How to Participate, Resources, News & Events, and Partners & Sponsors.

The main content area is titled 'REGISTER YOUR TSUNAMI PREPAREDNESS ACTIVITIES' and includes language options for 'ESPAÑOL | FRANÇAIS'. It contains three bullet points: 1) For new users, use the form on the left. 2) For previous users, login to the profile on the right. 3) For organizations already registered, create a new registration on the left. Below this is a link for event organizers to submit details to the calendar.

There are two registration paths:

- REGISTERING FOR THE FIRST TIME?**  
BEGIN Your Registration  
Fields: 'Who are you registering?' (dropdown), 'Please select your country:' (dropdown), and a 'Continue' button.
- REGISTERED IN PAST YEARS?**  
LOGIN to Renew Your Registration  
Fields: 'Enter your e-mail address:' (text input), 'TsunamiZone Password:' (text input), a link for 'I forgot my password.', and a 'Login' button.

A 'BENEFITS' section on the right lists advantages of registration, such as being counted as a participant, being listed with others, receiving updates, and having peace of mind.



**CARIBE WAVE 2016**

Regional Tsunami Exercises to be conducted in the Caribbean and Adjacent Regions on March 17, 2016: [Register Now!](#) ←

On March 17, 2016, the annual Caribbean and Adjacent Regions Tsunami Exercise, [CARIBE WAVE](#), will take place. UNESCO, the [U.S. National Tsunami Hazard Mitigation Program \(NTHMP\)](#), in the case of Puerto Rico and the US Virgin Islands, together with other regional organizations, are providing the framework. This exercise is a means for emergency responders throughout the Caribbean and Adjacent Regions serviced by the [Pacific Tsunami Warning Center \(PTWC\)](#), to test and update tsunami response plans with their at risk communities. The scenarios are based on tsunamis generated by major earthquakes located off the coast of Venezuela (14h00 UTC) and the second off the north coast of Hispaniola (15h00).

The initial kick off message will be issued by the Pacific Tsunami Warning Center (PTWC) over all standard broadcast channels to test communications and begin the exercise. It will be the only exercise message broadcast from the PTWC excluding special simulated email messages to officially designated Tsunami Warning Focal Points (TWFPs) and National Tsunami Warning Centers.

Each of the 48 Member States and Territories of the UNESCO IOC Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (CARIBE EWS) will decide the level of participation and coordinate the corresponding activities within their jurisdictions. In the U.S., the San Juan Weather Forecast Office of the [National Weather Service](#), the Puerto Rico Emergency Management Agency, the [Virgin Islands Territorial Emergency Management Agency](#) and the [Puerto Rico Seismic Network](#) are the points of contact for local activities. The [Caribbean Tsunami Warning Program](#) and the Caribbean Tsunami Information Center will be providing regional support. The exercise handbooks, as well as additional background materials and the links for registration and evaluation, are posted at [caribewave.info](#). High levels of vulnerability and risk to life and livelihoods from tsunamis along the Caribbean and Adjacent regions should provide a strong incentive for countries and communities to prepare for a tsunami and participate in this exercise.

**[Register today for the CARIBE WAVE 2016 exercise!](#)**

[ESPAÑOL](#) | [FRANÇAIS](#)



**UNESCO CARIBE EWS**

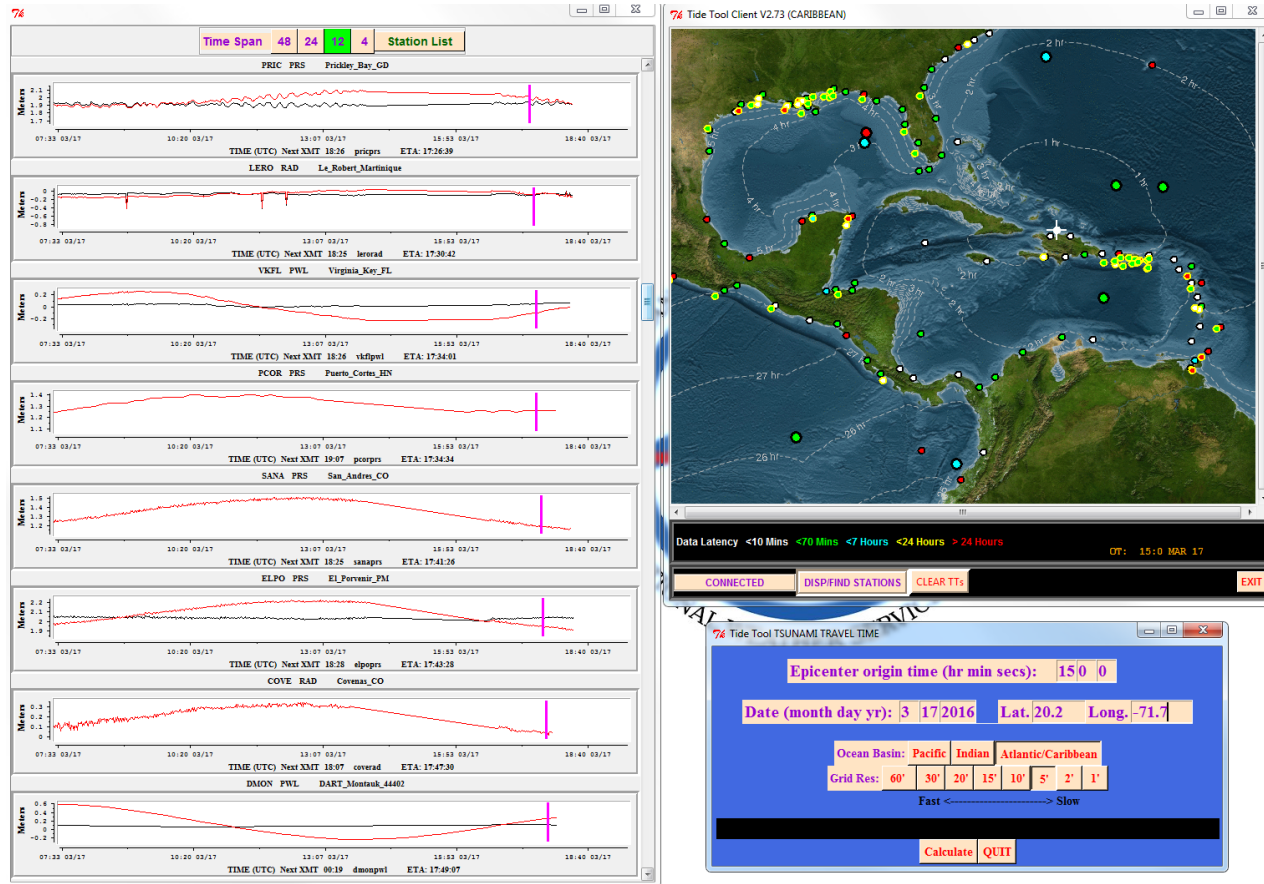
**UNESCO CARIBE EWS Member States and Territories**

Antigua and Barbuda*	Bahamas
Barbados	Belize
	Brazil**
Colombia	Costa Rica
	Cuba
Dominica	Dominican Republic
France ( <i>Guadeloupe, Guyane, Martinique, Saint Martin, St. Barthelemy</i> )	
Grenada	Guatemala
	Guyana
Haiti	Honduras
Jamaica	Mexico
Netherlands ( <i>Aruba***, Bonaire, Curaçao***, Saba, Sint Eustatius, Sint Maarten***</i> )	
Nicaragua	Panama
Saint Kitts and Nevis	Saint Lucia
Saint Vincent and the Grenadines	
Suriname	Trinidad and Tobago
United Kingdom of Great Britain & Northern Ireland ( <i>Anguilla***, Bermuda, British Virgin Islands***, Cayman Islands***, Montserrat***, Turks and Caicos</i> )	
United States ( <i>Puerto Rico and U.S. Virgin Islands</i> )	
Venezuela, Bolivarian Republic of	

Unlike previous years, Member States and interested parties were able to keep track of registration

# Other Aspects of the Exercise

# Tide Tool and Sea Level Stations

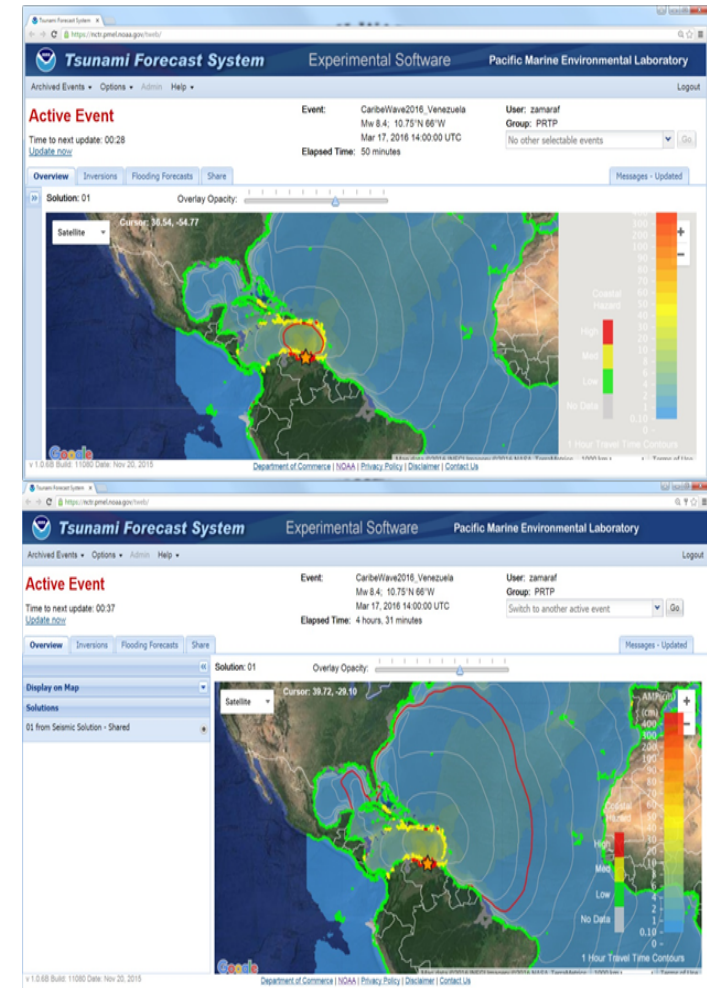


- Sea level stations were monitored in real time during the exercise using Tide Tool
- 67% of stations on IOC Sea Level facility had during the exercise time frame. In the case of TideTool 76% had data available.

# Tweb



Computed Event Magnitude: Mw 8.4



- Tweb is a tsunami forecasting tool that is currently being tested
- The software was used to model the CARIBE WAVE 16 Venezuela and Northern Hispaniola scenarios



# Member State Participation

- Member States established their own national task teams to determine the scope of their national participation and testing

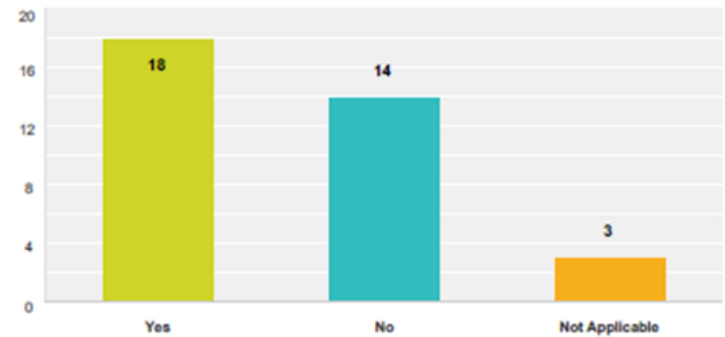


# Media Arrangements

- Sample press release was included in Handbook which could be adapted as necessary.
- Separate media report
- 51% of the survey respondents indicated that the exercise had media coverage (as compared with 48% in 2015 and 54% in 2014)

Q59 4.4: News media participated and covered the exercise (please provide electronic links if applicable).

Answered: 35 Skipped: 3



# Social Media

Several countries and territories publicized the exercise on social media and in the press. Exercise messages were disseminated and community participation was encouraged through social media outlets such as Facebook and Twitter. According to a real-time twitter trends service, the **hashtag #CaribeWave was a trend on March 17th in Venezuela, Colombia, Puerto Rico, and Panama.** Statistics for #CaribeWave reached **3,382 tweets the month of March.**

# Real Events/Procedure for False Alarm

- Any time disaster response exercises are conducted, the potential exists for the public or media to interpret the event as real.
- It was suggested that Procedures should be set up by all participating entities to address public or media concerns involving this exercise in case of mis-interpretation by media or the public.
- **NO** real events requiring action on behalf of the TWC took place during the event
- **NO** false alarms were reported

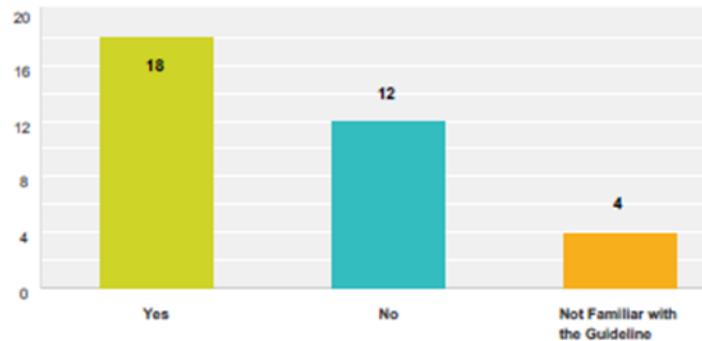


# Other Resources

- Draft IOC Manual “How to plan, conduct and evaluate tsunami exercises” which will also be a useful resource (English and Spanish).
- CARIBE WAVE 2011, 2013, 2014, 2015 Manuals
- CARIBE WAVE 2011, 2013, 2014 Reports
- PTWC Communications Plan for the Caribbean

Q81 Was the IOC How to Plan, Conduct, and Evaluate Tsunami Exercises guideline (<http://www.srh.noaa.gov/srh/ctwp>) used in preparing for the exercise?

Answered: 34 Skipped: 4

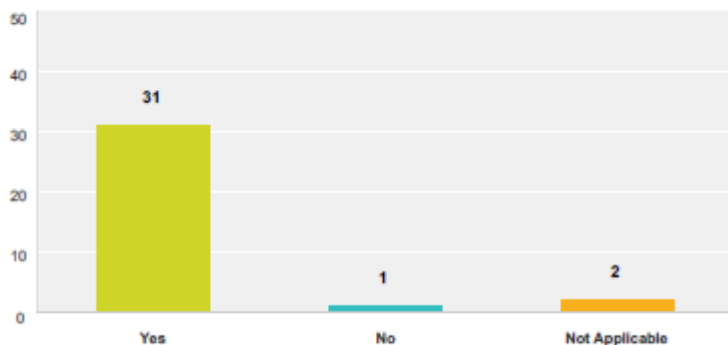


- **Notification Subscription Services**
  - Pacific Center (RSS/Emails)
  - National Center (RSS/Email)
- **Carib. Sea Level Stations**
  - Inventory of Stations (Google map)
  - IOC Sea Level Monitoring Facility
  - Status of Sea Level Data Availability
- **Seismic Stations**
  - IRIS CARIBE EWS Virtual Seismic Network
  - Sistema de Monitoreo de Estaciones RSPR
  - Status of Seismic Data Availability
- **Communications Systems**
  - EMWIN
  - NOAA Weather Radios
  - GTS
- **NOAA Tsunami Program**
  - CTWP Presentations
  - Tsunami Database
- **CARIBE EWS**
  - IOC Tsunami Programme Home
  - Organizational Structure & Governance
  - Communication Plan
  - Communication Test
- **Preparedness**
  - 2015 CARIBE WAVE/LANTEX Exercise
  - 2014 CARIBE WAVE/LANTEX Exercise
  - 2013 CARIBE WAVE/LANTEX Exercise
  - 2011 CARIBE WAVE/LANTEX Exercise
- **Education**
  - Tsunami Messages
  - COMET: Warning Systems
  - JetStream
  - NOAA Education
- **CTWP Activities**
  - Calendar
- **CTWP Office**
  - Staff
  - CTWP News
  - CTWP Homepage

# Satisfaction with resources

## Q79 The CARIBE WAVE 16 Participant Handbook provided an appropriate level of detail.

Answered: 34 Skipped: 4



There was an issue with the description of the source in the original handbook, this was corrected in March.

Intergovernmental Oceanographic Commission  
technical series

125

**EXERCISE CARIBE WAVE 16**

**A Caribbean and Adjacent Regions  
Tsunami Warning Exercise**

**17 March 2016**

**(Venezuela and Northern Hispaniola  
Scenarios)**

**Volume 1**

**Participant Handbook**

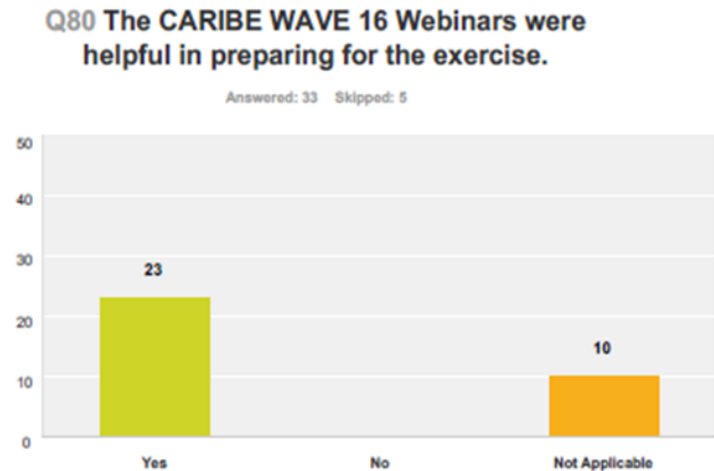


UNESCO 2015

# Webinars

- ✓ **19 January in English**
- ✓ **20 de enero en Español**
- ✓ **21 janvier à Français**
- ✓ **1 March in English**
- ✓ **2 de marzo en Español**
- ✓ **3 mars à Français**

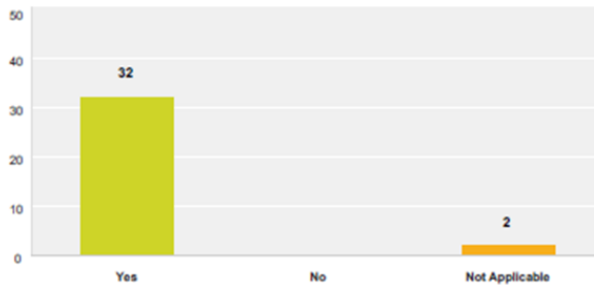
- CTWP organized 6 webinars
- Over 90 institutions participated in the two webinars, Member States/Territories participated in the webinars (up from 34 and 16 Member States in 2014 and 2015, )
- 100% of the participants found the webinars to be helpful.



# Websites

Q78 The CARIBE WAVE 16 Tsunami Exercise website pages (eg. [caribewave.info](http://caribewave.info), [tsunamizone.org/caribbean](http://tsunamizone.org/caribbean)) were useful.

Answered: 34 Skipped: 4



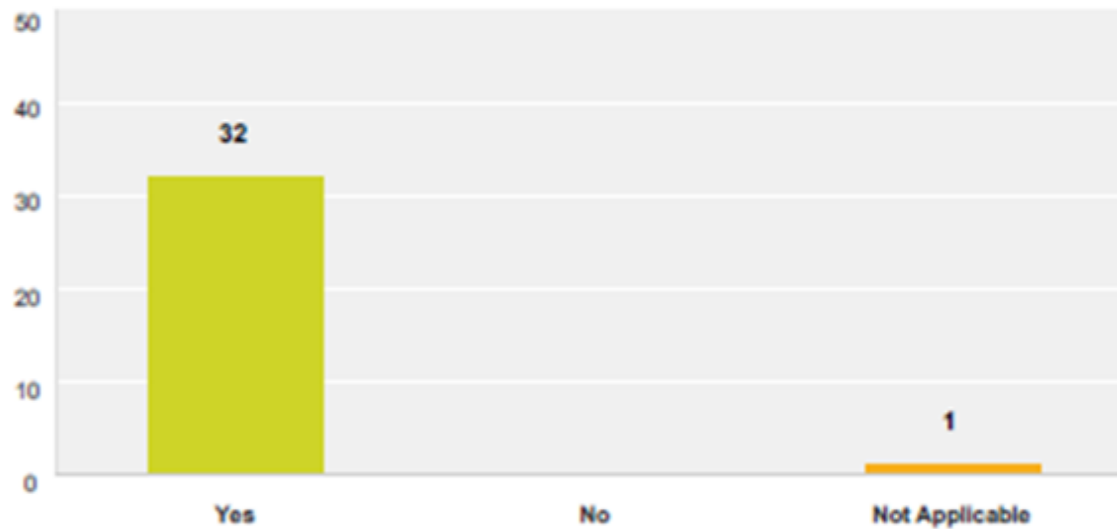
Answer Choices	Responses	Count
Yes	94.12%	32
No	0.00%	0
Not Applicable	5.88%	2
<b>Total</b>		<b>34</b>

(Similar to 2015, it was 89% in 2014)

# Overall Satisfaction

**Q74 Overall, the exercise planning, conduct, format and style were satisfactory.**

Answered: 33 Skipped: 5

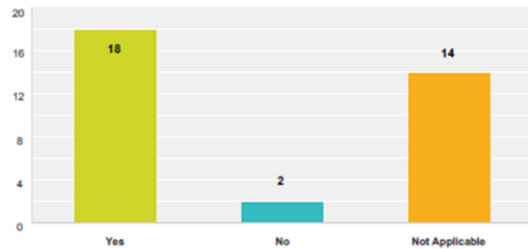


Answer Choices	Responses	
Yes	96.97%	32
No	0.00%	0
Not Applicable	3.03%	1
<b>Total</b>		<b>33</b>

# PAE

**Q66 Have you found the PAE strategy framework useful?**

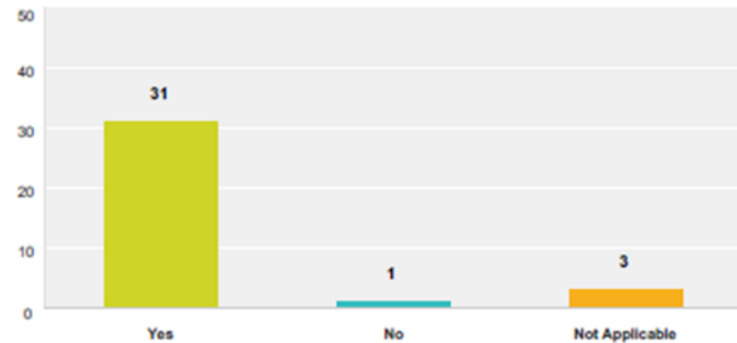
Answered: 34 Skipped: 4



- Noted that training should be for TNCs

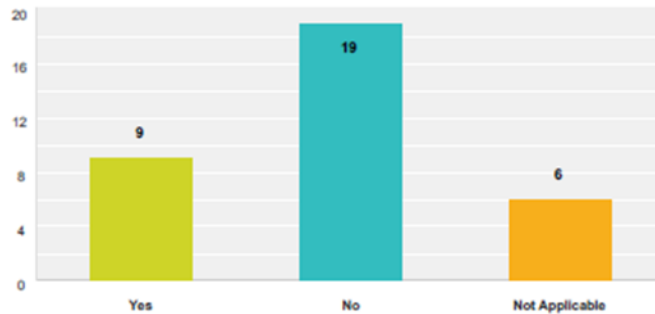
**Q68 Do you believe that a specific training should be given to help prepare a Tsunami PAE plan?**

Answered: 35 Skipped: 3



**Q67 The Strategy recommends that the Tsunami PAE framework be adapted to regional/national/local experiences. Has your country/agency prepared a Tsunami PAE Plan?**

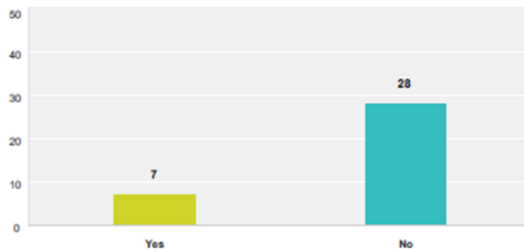
Answered: 34 Skipped: 4



# Tsunami Ready

Q69 Is your country already implementing the Community Performance Based Tsunami Recognition Program (TsunamiReady or Tsunami Ready)?

Answered: 35 Skipped: 3



Answer Choices	Responses	Count
Yes	20.00%	7
No	80.00%	28
Total		35

Q71 Is your country already interested in implementing the Community Performance Based Tsunami Recognition Program (TsunamiReady or Tsunami Ready)?

Answered: 35 Skipped: 3

## Comments:

No, not yet

Is already implemented. Anguilla and BVI has been certified TsunamiReady.

Yes, we are interested. Looking at the possibilities of implementing it either country wide or break it down to community level.

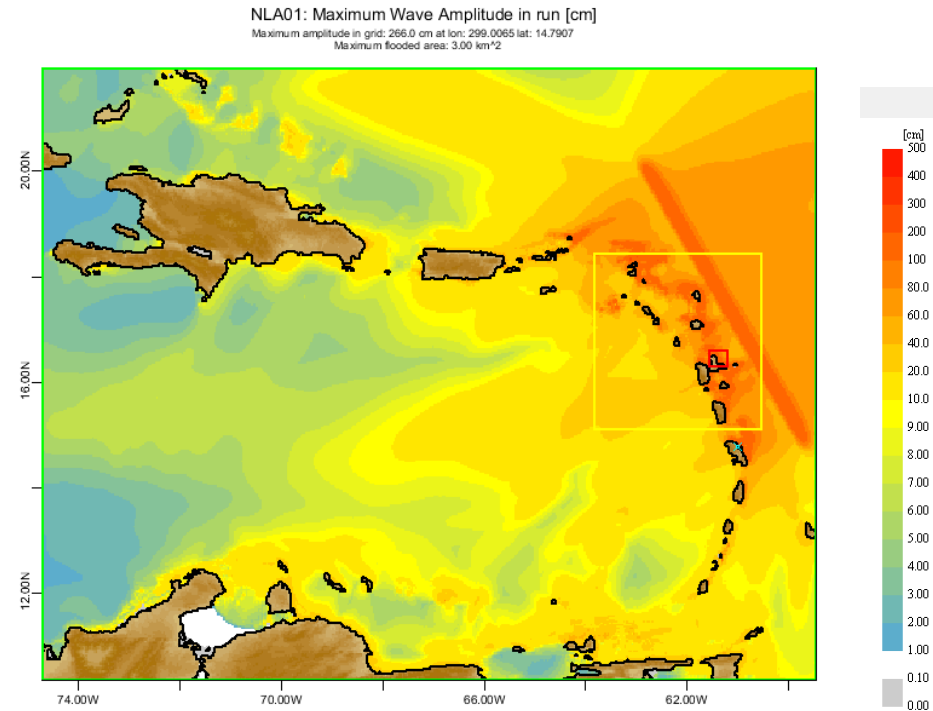
Yes, but not immediately.

We need to do some homework first (mapping and evacuation planning).

I'm not sure. Maybe in the future.

# Looking ahead, Tasks for this meeting

- Scenario and Caribe Wave 17 Date/time selection and confirmation
- Discuss difficulties of running multiple scenarios/explore solutions
- Discuss if the survey can be shortened (what can be eliminated?)
- Create a new task team for the Caribe wave 17 exercise.





# CARIBE WAVE 16 Task Team

Person	Telephone #	Email
Elizabeth Vanacore, PRSN, CARIBE WAVE 16 Chair	1-787-833-8433	<a href="mailto:elizabeth.vanacore@upr.edu">elizabeth.vanacore@upr.edu</a>
Christa von Hillebrandt-Andrade, CARIBE EWS Chair; NWS CTWP Manager	1-787-249-8307	<a href="mailto:christa.vonh@noaa.gov">christa.vonh@noaa.gov</a>
Milton Puentes, CARIBE EWS Vice Chair	57-1-2020490	<a href="mailto:milpuentes@gmail.com">milpuentes@gmail.com</a>
Denis Lopez, CARIBE EWS Vice Chair	596-596-39393	<a href="mailto:denis.lopez@martinique.pref.gouv.fr">denis.lopez@martinique.pref.gouv.fr</a>
Aura Fernandez, CARIBE EWS Vice Chair	582-122575153	<a href="mailto:aefernandez@funvisis.gob.ve">aefernandez@funvisis.gob.ve</a>
Jean Marie Saurel, CARIBE EWS Chair WG1	596-596-784146	<a href="mailto:saurel@ipgp.fr">saurel@ipgp.fr</a>
Alberto Lopez, CARIBE EWS Chair WG2	1-787-832-4040	<a href="mailto:alberto.lopez3@upr.edu">alberto.lopez3@upr.edu</a>
Antonio Aguilar, CARIBE EWS Chair WG3	582-122575153	<a href="mailto:antoniodesastres@gmail.com">antoniodesastres@gmail.com</a>
Patrick Tyburn, CARIBE EWS Chair WG4	596-596-393813	<a href="mailto:patrick.tyburn@martinique.pref.gouv.fr">patrick.tyburn@martinique.pref.gouv.fr</a>
Alison Brome, Interim Director, CTIC	1-246-622-1610 x1002	<a href="mailto:a.brome@unesco.org">a.brome@unesco.org</a>
Charles McCreery, PTWC Director	1-808-689-8207	<a href="mailto:charles.mccreery@noaa.gov">charles.mccreery@noaa.gov</a>
Gerard Fryer, PTWC Rep.	1-808-689-8207	<a href="mailto:gerard.fryer@noaa.gov">gerard.fryer@noaa.gov</a>
Víctor Huérfano, PRSN Director	1-787-833-8433	<a href="mailto:victor@prsn.uprm.edu">victor@prsn.uprm.edu</a>
Ronald Jackson, Director CDEMA	246-425-0386	<a href="mailto:ronald.jackson@cdema.org">ronald.jackson@cdema.org</a>
Roy Barboza Sequeira, Executive Secretary, CEPREDENAC	502-2390-0200	<a href="mailto:rbarboza@sica.int">rbarboza@sica.int</a>
Bernardo Aliaga, Technical Secretary UNESCO	33-1-45683980	<a href="mailto:b.aliaga@unesco.org">b.aliaga@unesco.org</a>
Walt Zaleski, NWS Southern Region WCM	1-817-978-1100 x107	<a href="mailto:walt.zaleski@noaa.gov">walt.zaleski@noaa.gov</a>
Wilfredo Ramos, PREMA Rep.	1-787-724-0124 x20036	<a href="mailto:wramos@prema.pr.gov">wramos@prema.pr.gov</a>
Heriberto Fabian, Scientific Expert, Dominican Republic	001-829-932-2318	<a href="mailto:fabianespinal@gmail.com">fabianespinal@gmail.com</a>
Frank Audemard (Funvisis), CARIBE EWS Vice Chair WG2	582-122575153	<a href="mailto:faudemard@funvisis.gob.ve">faudemard@funvisis.gob.ve</a>

# Special Thanks

## In addition to those in Task Team

- University of Southern California (Mr. Mark Benthien) and NTHMP for the Registration System
- Thanks to Patrick Tyburn for translation into French and PRSN translation into Spanish
- Dennis Cain, NWS SR for updates to CTWP website with CARIBE WAVE materials
- CTWP Student Interns Jean-Edouard Faucher, Gwendelyn Monge, Fernando Martínez, Zamara Fuentes, Carlos Rivera
- Many more, it takes a COMMUNITY to do an exercise



# Questions, Comments, Feedback

“This has been a remarkable improvement nationally. The community engagement and participation level was simply overwhelming.” (Grenada)

Thank you

[elizabeth.vanacore@upr.edu](mailto:elizabeth.vanacore@upr.edu)

[christa.vonh@noaa.gov](mailto:christa.vonh@noaa.gov)